

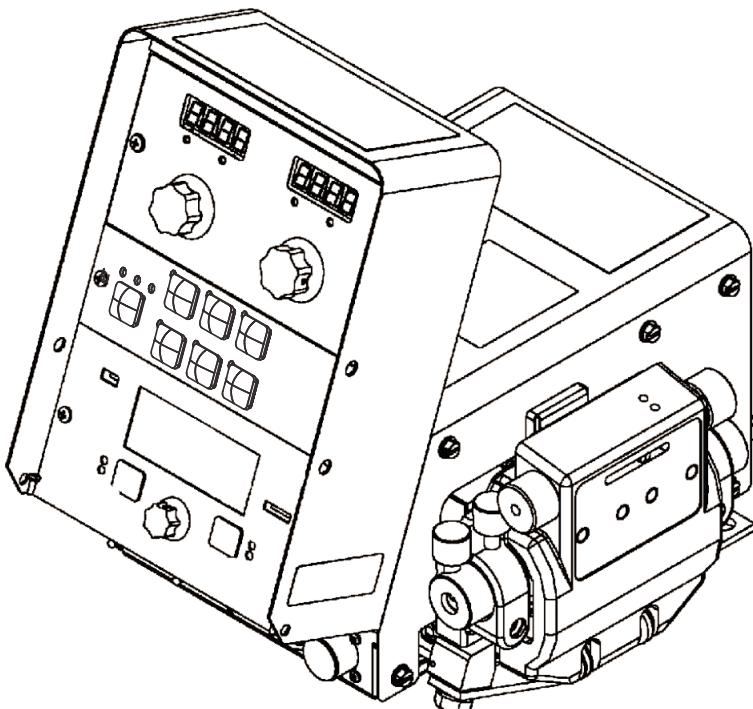
POWER FEED™ 10M WIRE FEEDER

February, 2011

For use with machines having Code Numbers: **11086, 11193, 11216, 11439, 11771, 11772**

Safety Depends on You

Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.



OPERATOR'S MANUAL



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• World's Leader in Welding and Cutting Products •

• Sales and Service through Subsidiaries and Distributors Worldwide •

Cleveland, Ohio 44117-1199 U.S.A. TEL: 1.888.935.3877 FAX: 216.486.1751 WEB SITE: www.lincolnelectric.com

WARNING**CALIFORNIA PROPOSITION 65 WARNINGS**

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

The Above For Diesel Engines

The Above For Gasoline Engines

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.



FOR ENGINE powered equipment.

1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.



1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.



1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.

1.d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.



1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.



1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.



ELECTRIC AND MAGNETIC FIELDS may be dangerous

2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines

2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

2.c. Exposure to EMF fields in welding may have other health effects which are now not known.

2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

2.d.1. Route the electrode and work cables together - Secure them with tape when possible.

2.d.2. Never coil the electrode lead around your body.

2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.

2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.

2.d.5. Do not work next to welding power source.



ELECTRIC SHOCK can kill.

- 3.a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not touch these "hot" parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
- 3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

- Semiautomatic DC Constant Voltage (Wire) Welder.
- DC Manual (Stick) Welder.
- AC Welder with Reduced Voltage Control.

- 3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically "hot".
- 3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
- 3.e. Ground the work or metal to be welded to a good electrical (earth) ground.
- 3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
- 3.g. Never dip the electrode in water for cooling.
- 3.h. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
- 3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.
- 3.j. Also see Items 6.c. and 8.



ARC RAYS can burn.

- 4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.
- 4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.
- 4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.



FUMES AND GASES can be dangerous.

- 5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding with electrodes which require special ventilation such as stainless or hard facing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and within applicable OSHA PEL and ACGIH TLV limits using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**
- 5.b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.
- 5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
- 5.d. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.
- 5.e. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices. MSDS forms are available from your welding distributor or from the manufacturer.
- 5.f. Also see item 1.b.



WELDING and CUTTING SPARKS can cause fire or explosion.

- 6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.
- 6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.
- 6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- 6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).
- 6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- 6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- 6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
- 6.h. Also see item 1.c.
- 6.i. Read and follow NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work", available from NFPA, 1 Batterymarch Park, PO box 9101, Quincy, MA 022690-9101.
- 6.j. Do not use a welding power source for pipe thawing.



CYLINDER may explode if damaged.

- 7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.
- 7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.
- 7.c. Cylinders should be located:
 - Away from areas where they may be struck or subjected to physical damage.
 - A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
- 7.d. Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.
- 7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- 7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.
- 7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.



FOR ELECTRICALLY powered equipment.

- 8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.
- 8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.
- 8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

Refer to <http://www.lincolnelectric.com/safety> for additional safety information.

PRÉCAUTIONS DE SÛRETÉ

Pour votre propre protection lire et observer toutes les instructions et les précautions de sûreté spécifiques qui paraissent dans ce manuel aussi bien que les précautions de sûreté générales suivantes:

Sûreté Pour Soudage A L'Arc

1. Protegez-vous contre la secousse électrique:
 - a. Les circuits à l'électrode et à la pièce sont sous tension quand la machine à souder est en marche. Eviter toujours tout contact entre les parties sous tension et la peau nue ou les vêtements mouillés. Porter des gants secs et sans trous pour isoler les mains.
 - b. Faire très attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher métallique ou des grilles métalliques, principalement dans les positions assis ou couché pour lesquelles une grande partie du corps peut être en contact avec la masse.
 - c. Maintenir le porte-électrode, la pince de masse, le câble de soudage et la machine à souder en bon et sûr état définitionnement.
 - d. Ne jamais plonger le porte-électrode dans l'eau pour le refroidir.
 - e. Ne jamais toucher simultanément les parties sous tension des porte-électrodes connectés à deux machines à souder parce que la tension entre les deux pinces peut être le total de la tension à vide des deux machines.
 - f. Si on utilise la machine à souder comme une source de courant pour soudage semi-automatique, ces précautions pour le porte-électrode s'appliquent aussi au pistolet de soudage.
2. Dans le cas de travail au dessus du niveau du sol, se protéger contre les chutes dans le cas où on reçoit un choc. Ne jamais enrouler le câble-électrode autour de n'importe quelle partie du corps.
3. Un coup d'arc peut être plus sévère qu'un coup de soleil, donc:
 - a. Utiliser un bon masque avec un verre filtrant approprié ainsi qu'un verre blanc afin de se protéger les yeux du rayonnement de l'arc et des projections quand on soude ou quand on regarde l'arc.
 - b. Porter des vêtements convenables afin de protéger la peau de soudeur et des aides contre le rayonnement de l'arc.
 - c. Protéger l'autre personnel travaillant à proximité au soudage à l'aide d'écrans appropriés et non-inflammables.
4. Des gouttes de laitier en fusion sont émises de l'arc de soudage. Se protéger avec des vêtements de protection libres de l'huile, tels que les gants en cuir, chemise épaisse, pantalons sans revers, et chaussures montantes.

5. Toujours porter des lunettes de sécurité dans la zone de soudage. Utiliser des lunettes avec écrans latéraux dans les zones où l'on pique le laitier.
6. Eloigner les matériaux inflammables ou les recouvrir afin de prévenir tout risque d'incendie dû aux étincelles.
7. Quand on ne soude pas, poser la pince à une endroit isolé de la masse. Un court-circuit accidentel peut provoquer un échauffement et un risque d'incendie.
8. S'assurer que la masse est connectée le plus près possible de la zone de travail qu'il est pratique de le faire. Si on place la masse sur la charpente de la construction ou d'autres endroits éloignés de la zone de travail, on augmente le risque de voir passer le courant de soudage par les chaînes de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'échauffement des chaînes et des câbles jusqu'à ce qu'ils se rompent.
9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particulièrement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumées toxiques.
10. Ne pas souder en présence de vapeurs de chlore provenant d'opérations de dégraissage, nettoyage ou pistolet. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs du solvant pour produire du phosgène (gas fortement toxique) ou autres produits irritants.
11. Pour obtenir de plus amples renseignements sur la sûreté, voir le code "Code for safety in welding and cutting" CSA Standard W 117.2-1974.

PRÉCAUTIONS DE SÛRETÉ POUR LES MACHINES À SOUDER À TRANSFORMATEUR ET À REDRESSEUR

1. Relier à la terre le chassis du poste conformément au code de l'électricité et aux recommandations du fabricant. Le dispositif de montage ou la pièce à souder doit être branché à une bonne mise à la terre.
2. Autant que possible, l'installation et l'entretien du poste seront effectués par un électricien qualifié.
3. Avant de faire des travaux à l'intérieur de poste, la débrancher à l'interrupteur à la boîte de fusibles.
4. Garder tous les couvercles et dispositifs de sûreté à leur place.

Thank You—

for selecting a **QUALITY** product by Lincoln Electric. We want you to take pride in operating this Lincoln Electric Company product ... as much pride as we have in bringing this product to you!

CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for advice or information about their use of our products. We respond to our customers based on the best information in our possession at that time. Lincoln Electric is not in a position to warrant or guarantee such advice, and assumes no liability, with respect to such information or advice. We expressly disclaim any warranty of any kind, including any warranty of fitness for any customer's particular purpose, with respect to such information or advice. As a matter of practical consideration, we also cannot assume any responsibility for updating or correcting any such information or advice once it has been given, nor does the provision of information or advice create, expand or alter any warranty with respect to the sale of our products.

Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.com for any updated information.

Please Examine Carton and Equipment For Damage Immediately

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, Claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Product _____

Model Number _____

Code Number or Date Code_____

Serial Number_____

Date Purchased_____

Where Purchased_____

Whenever you request replacement parts or information on this equipment, always supply the information you have recorded above. The code number is especially important when identifying the correct replacement parts.

On-Line Product Registration

- Register your machine with Lincoln Electric either via fax or over the Internet.
 - For faxing: Complete the form on the back of the warranty statement included in the literature packet accompanying this machine and fax the form per the instructions printed on it.
 - For On-Line Registration: Go to our **WEB SITE** at www.lincolnelectric.com. Choose "Quick Links" and then "Product Registration". Please complete the form and submit your registration.

Read this Operators Manual completely before attempting to use this equipment. Save this manual and keep it handy for quick reference. Pay particular attention to the safety instructions we have provided for your protection. The level of seriousness to be applied to each is explained below:

⚠ WARNING

This statement appears where the information **must** be followed **exactly** to avoid **serious personal injury or loss of life**.

⚠ CAUTION

This statement appears where the information **must** be followed to avoid **minor personal injury or damage to this equipment**.

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TECHNICAL SPECIFICATIONS: Power Feed™ 10M Single Wire Feeder

			WIRE DRIVE OR WIRE DRIVE SECTION OF FEEDER					
SPEC.#	TYPE	Low Speed	LOW SPEED RATIO			HIGH SPEED RATIO		
			Solid	Cored		High Speed		Wire Size
K2230-1	Bench Model	50-800 IPM (1.27-20.3 m/m)	.025 - 3/32 in. (0.6 - 2.4 mm)	.035 - .120 in. (0.9 - 3.0 mm)		75 - 1200 IPM (2.0 - 30.5 m/m)		.025 - 1/16 in. (0.6 - 1.6 mm)
K2314-1	Boom Model							.035 - 5/64 in. (0.9 - 2.0 mm)

			CONTROL BOX, WIRE DRIVE AND COMPLETE UNITS					
SPEC.#	TYPE	INPUT POWER	PHYSICAL SIZE•			TEMPERATURE RATING		
			Dimensions			Weight	Operating	Storage
K2230-1	Wire Drive & Reel Stand		18.5" (470 mm)	13.5" (345 mm)	30.5" (775 mm)	62 Lbs (28.1 Kg.)		
K2314-1	Control Box only	40VDC	Height 13.0" (330 mm)	Width 8.5" (215 mm)	Depth 4.0" (105 mm)	Weight 8.5 Lbs (3.8 Kg.)	14°F to 140°F (-10°C to 40°C)	-40°F to 185°F (-40°C to 40°C)
K2314-1	Wire Drive Unit only		Height 7.6" (195 mm)	Width 12.9" (325 mm)	Depth 13.7" (345 mm)	Weight 30 Lbs (13.6 Kg.)		

WELDING CAPACITY RATING

Amp Rating	Duty Cycle
600 A	60%
500 A	100%

Δ Dimensions do not include wire reel.

SAFETY PRECAUTION



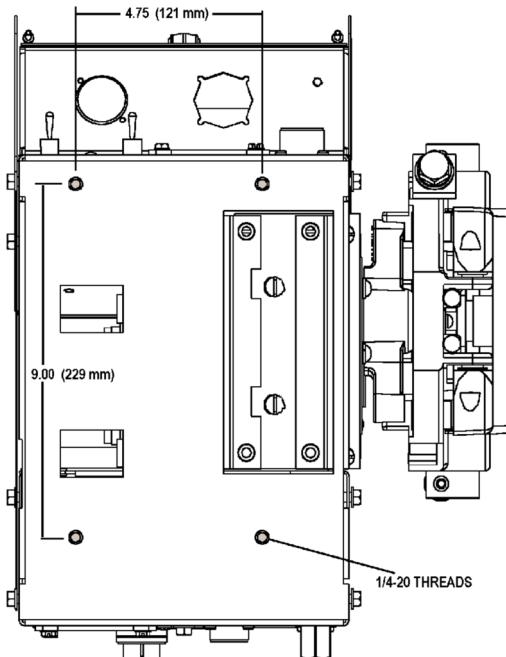
- ELECTRIC SHOCK can kill.**
- Only qualified personnel should perform this installation.
 - Turn off the input power to the power source at the disconnect switch or fuse box before working on this equipment. Turn off the input power to any other equipment connected to the welding system at the disconnect switch or fuse box before working on this equipment.
 - Do not touch electrically hot parts.

LOCATION

- The Power Feed™ 10M Single Wire Feeder has an IP21 rating, suitable for indoor use.
- The Power Feed™ 10M Single Wire Feeder should be operated in a substantially upright position.
- Do not submerge the Power Feed™ 10M Single Wire Feeder.
- The Power Feed™ 10M Single Wire Feeder is not suitable for stacking.

Locate the Power Feed™ 10M Single Wire Feeder away from radio controlled machinery. The normal operation of the Power Feed™ 10M Single Wire Feeder may adversely affect the operation of RF controlled equipment, which may result in bodily injury or damage to the equipment.

FIGURE A.1



MOUNTING

Wire Drive Mounting (See Figure A.1)

The wire drive may be mounted by using the four holes on the bottom. Because the feed plate and gearbox are electrically "hot" when welding, make certain the parts do not contact the any structure or person.

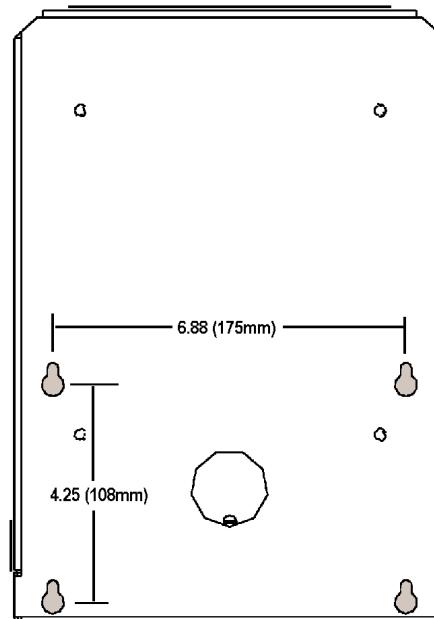
Mount the wire drive with the drive rolls in the vertical plane to prevent dirt from collecting in the wire drive. Angle the drive and feed plate to prevent sharp bends in the gun and cable and incoming wire.

Control Box Mounting (See Figure A.2)

Boom model Power Feed™ 10M Single Wire Feeder's feature a control box that mounts separately from the wire drive.

The back of the control box has four keyhole slots for mounting. #10 screws are recommended for mounting.

FIGURE A.2



SAFETY PRECAUTION**ELECTRIC SHOCK can kill.**

- Only qualified personnel should perform this installation.
- Turn off the input power to the power source at the disconnect switch or fuse box before working on this equipment. Turn off the input power to any other equipment connected to the welding system at the disconnect switch or fuse box before working on this equipment.
- Do not touch electrically hot parts.

WELD CABLE SIZING

Minimum work and electrode cables sizes are as follows:

TABLE A.1

(Current (60% Duty Cycle)	MINIMUM COPPER WORK CABLE SIZE AWG
400 Amps	Up To-100 Ft. Length (30 m) 2/0 (67 mm ²)
500 Amps	3/0 (85 mm ²)
600 Amps	3/0 (85 mm ²)

NOTE: K1796 coaxial welding cable is recommended to reduce the cable inductance in long distance Pulse or STT applications up to 300 amps.

WELD CABLE CONNECTION

Connect a work lead of sufficient size and length (Per Table A.1) between the proper output terminal on the power source and the work. Be sure the connection to the work makes tight metal-to-metal electrical contact. To avoid interference problems with other equipment and to achieve the best possible operation, route all cables directly to the work or wire feeder. Avoid excessive lengths and do not coil excess cable.

! CAUTION

When using an inverter type power source like the Power Waves, use the largest welding (electrode and work) cables that are practical. At least 2/0 copper wire - even if the average output current would not normally require it. When pulsing, the pulse current can reach very high levels. Voltage drops can become excessive, leading to poor welding characteristics, if undersized welding cables are used.

WELD CABLE SIZES

Table A.2 has the copper cable sizes recommended for different currents and duty cycles. Lengths stipulated are the distance from the welder to work and back to the welder again. Cable sizes are increased for greater lengths primarily for the purpose of minimizing voltage in the welding circuit.

ELECTRODE LEAD

Most welding applications run with the electrode being positive (+). For those applications, connect the electrode cable between the wire feeder and the positive (+) output stud on the power source. Connect the lug at the other end of the electrode cable to the wire drive feed plate. Be sure the connection to the feed plate makes tight metal-to-metal electrical contact. The electrode cable should be sized according to the specifications given in the work cable connections Table A.1. Connect a work lead from the negative (-) power source output stud to the work piece. The work piece connection must be firm and secure, especially if pulse welding is planned.

TABLE A.2

		RECOMMENDED CABLE SIZES (RUBBER COVERED COPPER - RATED 75°C)**				
Amperes	Percent Duty Cycle	CABLE SIZES FOR COMBINED LENGTHS OF ELECTRODE AND WORK CABLES				
		0 to 50 Ft. 0 to 15 m	50 to 100Ft. 15 to 31 m	100 to 150 Ft. 31 to 48 m	150 to 200 Ft. 48 to 61 m	200 to 250 Ft. 61 to 76 m
325	100	2/0	2/0	2/0	2/0	3/0
350	60	1/0	1/0	2/0	2/0	3/0
400	60	2/0	2/0	2/0	3/0	4/0
400	100	3/0	3/0	3/0	3/0	4/0
500	60	2/0	2/0	3/0	3/0	4/0

** Tabled values are for operation at ambient temperatures of 40°C and below. Applications above 40°C may require cables larger than recommended, or cables rated higher than 75°C.

For Electrode Polarity:	Connect the Electrode lead to	Connect the work lead to
Positive	Positive Stud	Negative
Negative	Negative Stud	Positive Stud

For additional Safety information regarding the electrode and work cable set-up, See the standard "SAFETY INFORMATION" located in the front of the Instruction Manuals.



CAUTION

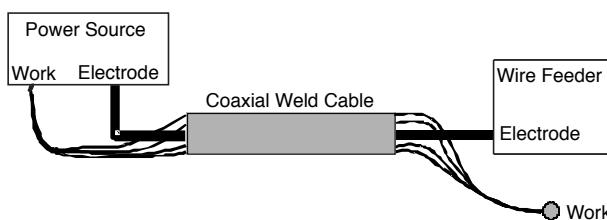
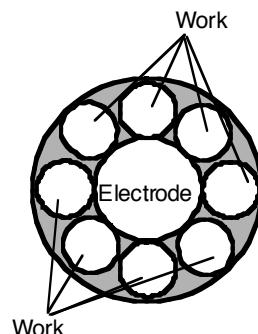
Excessive voltage drops caused by poor work piece connections often result in unsatisfactory welding performance.

COAXIAL WELD CABLES

Coaxial welding cables are specially designed welding cables for pulse welding or STT welding. Coaxial weld cables feature low inductance, allowing fast changes in the weld current. Regular cables have a higher inductance which may distort the pulse or STT wave shape. Inductance becomes more severe as the weld cables become longer.

Coaxial weld cables are recommended for all pulse and STT welding, especially when the total weld cable length (electrode cable + work cable) exceeds 50 feet (7.6m)

A coaxial weld cable is constructed by 8 small leads wrapped around one large lead. The large inner lead connects to the electrode stud on the power source and the electrode connection on the wire feeder. The small leads combine together to form the work lead, one end attached to the power source and the other end to the work piece. (See Coaxial weld Cable below.)



CHANGING ELECTRODE POLARITY SETTING

The Power Feed™ 10M Single Wire Feeder is preset at the factory for Electrode Positive welding. (See Figure A.3)

NOTE: Changing this DIP Switch does not change the actual welding polarity. The actual welding polarity is changed by reversing the welding cables at the power source output studs.

This DIP Switch setting must coincide with the polarity you are setting up to weld with for the feeder to operate correctly. Operating the Power Feed™ 10M Single Wire Feeder with the DIP switch in the wrong position will cause very erratic weld characteristics.

NEGATIVE ELECTRODE POLARITY

This options allows for the setting of negative polarity sensing when a negative polarity welding process is performed.

When negative electrode polarity is required, such as in some Innershield applications, reverse the output connections at the power source (electrode cable to the negative (-) stud, and work cable to the positive (+) stud).

When operating with electrode polarity negative the Power Feed™ 10M Single Wire Feeder must be set to recognize this set-up. (See Figure A.3)

To change the electrode polarity DIP Switch setting:

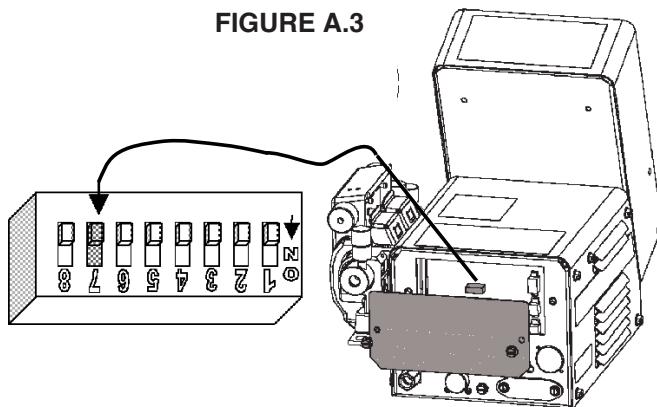


- Do not touch electrically live parts or electrodes with your skin or wet clothing.
- Insulate yourself from the work and ground.
- Always wear dry insulating gloves.

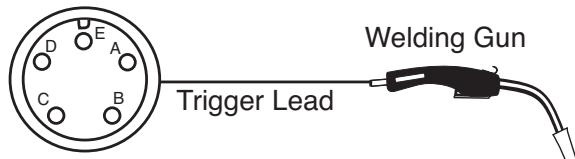
1. Turn off power at the welding power source.
2. Remove the rear access panel on the wire drive.
3. Locate the DIP switches on the Wire Drive Board.
4. Set DIP switch #7 to the desired polarity.
5. Reinstall the rear access panel and restore power.

DIP Switch #7 Position	Polarity
ON	(negative) - polarity
OFF	(positive) + polarity

FIGURE A.3

**Welding Gun/Wire Feeder Trigger Connector**

Wire Feeder
Amphenol

**Wire Feeder**

Pin	Function
A	Gun Trigger
B	-
C	Common
D	Dual Procedure
E	Common

CONTROL CABLE**CONTROL CABLE CONNECTIONS**

- All system control cables are the same.
- All control cables can be connected end to end to extend their length.
- All system equipment must be connected to a control cable.

Typical Bench Feeder Connection:

Control cable is connected from the Power Wave Source output Amphenol receptacle to the input Amphenol receptacle on the back of the Wire Drive.

Digital Control Cable, K1543-xx

Pin	Function
A	Digital I/O
B	Digital I/O
C	"67" voltage sense
D	40 VDC
E	40 VDC

Use a maximum of 250 feet (76.2m) of control cable between components.

CONTROL CABLE SPECIFICATIONS

It is recommended that only genuine Lincoln control cables be used at all times. Lincoln cables are specifically designed for the communication and power needs of the Power Wave Source / Power Feed system. The use of non-standard cables, especially in lengths greater than 25ft(7.6m), can lead to communication problems (system shutdowns), poor motor acceleration (poor arc starting) and low wire driving force (wire feeding problems).

Lincoln control cables are copper 5 conductor cable in a SO-type rubber jacket. There is one 20 gauge twisted pair for network communications. This pair has an impedance of approximately 120 ohms and a propagation delay per foot of less than 2.1 nanoseconds. There are two 12 gauge conductors that are used to supply the 40 VDC to the network. The fifth wire is 18 gauge and is used as an electrode sense lead.

AVAILABLE CONTROL CABLE

K1543 Control cable only. Available in lengths of 8'(2.4m), 16'(4.9m), 25'(7.6m), 50'(15.2m) and 100'(30.5m).

WIRE DRIVE SYSTEMS

Drive Roll Kits are designed to feed specific types and wire sizes. The Power Feed™ 10M Single Wire Feeder does not include these Drive Roll Kits with this Wire Drive, but are available for ordering from the following tables:

Drive Roll Kits, Steel Wires

Includes: 4 Smooth V groove drive rolls and an inner wire guide.

KP1505-030S	.023-.030 (0.6-0.8mm)
KP1505-035S	.035 (0.9mm)
KP1505-045S	.045 (1.2mm)
KP1505-052S	.052 (1.4mm)
KP1505-1/16S	1/16 (1.6mm)

Drive Roll Kits, Cored Wires

Includes: 4 Knurled drive rolls and an inner wire guide.

KP1505-035C	.030-.035" (0.8-0.9mm)
KP1505-045C	.040-.045" (1.0-1.2mm)
KP1505-052C	.052" (1.4mm)
KP1505-1/16C	1/16" (1.6mm)

Drive Roll Kits, Steel or Cored Wires

Includes: 4 Knurled drive rolls and an inner wire guide.

KP1505-068	.068-.072" (1.8mm)
KP1505-5/64	5/64" (2.0mm)
KP1505-3/32	3/32" (2.4mm)
KP1505-7/64	7/64" (2.8mm)
KP1505-.120	.120" (3.2mm)

Drive Roll Kits, Hardfacing Wires

Includes: 2 Knurled drive rolls, 2 Smooth V groove drive rolls and an inner wire guide.

KP1505-7/64C	7/64" (2.8mm)
--------------	---------------

Drive Roll Kits, Aluminum Wire

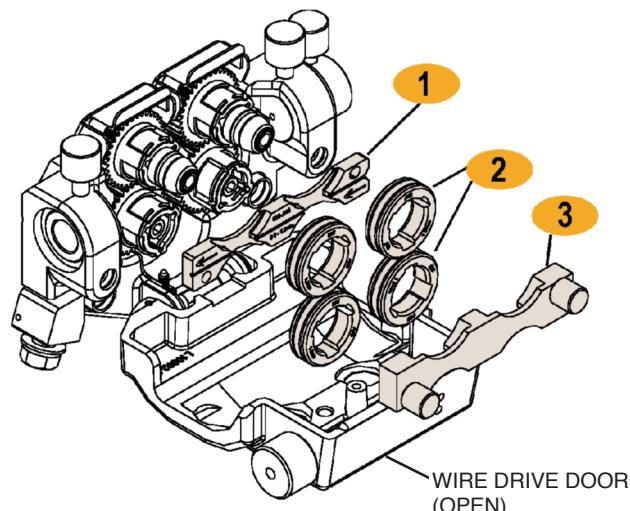
Includes: 4 polished U groove drive rolls, outer wire guide and an inner wire guide.

KP1507-035A	.035" (0.9 mm)
KP1507-040A	.040" (1.0mm)
KP1507-3/64A	3/64" (1.2mm)
KP1507-1/16A	1/16" (1.6mm)
KP1507-3/32A	3/32" (2.4mm)



CHANGING DRIVE ROLLS AND WIRE GUIDES

FIGURE A.4



ITEM	DESCRIPTION
1	Inner Wire Guide
2	Drive Rolls
3	Outer Wire Guide

To change drive rolls and wire guides:

1. Turn off power at the welding power source.
2. Open wire drive door.
3. Remove the outer wire guide. (Item #3)
4. Remove the 4 drive rolls (Item #2) by pulling them straight off of the drive hub. Rock the upper drive rolls back for ease of removal.
5. Remove the inner wire guide (Item #1).
6. Insert the new inner wire guide (Item #1) over the locating pins of the feed plate.
7. Install each drive roll by pushing it onto the hub until it fully seats.
8. Install the outer wire guide.
9. Swing the upper drive rolls down and close the wire drive door.

DRIVE ROLL PRESSURE SETTING

The Power Feed™ 10M Single Wire Feeder is factory set with the pressure indicator approximately "2". The best drive roll pressure varies with wire type, wire surface, lubrication and hardness. Too much pressure could cause "birdnesting", but too little pressure could cause slippage.

Set the drive roll pressure by:

1. Press the end of the gun against a solid object that is electrically isolated from the welder output and press the gun trigger for several seconds.
2. If the wire "birdnests" or jams, the drive roll pressure is too high. Reduce the pressure by one turn of the knob, run new wire through the gun, and repeat step 1.
3. If the only result is slippage, disconnect the gun and pull the gun cable forward about 6" (150mm). There should be a slight waviness in the exposed wire. If there is no waviness, increase the pressure setting one turn, reconnect the gun and repeat the above steps.

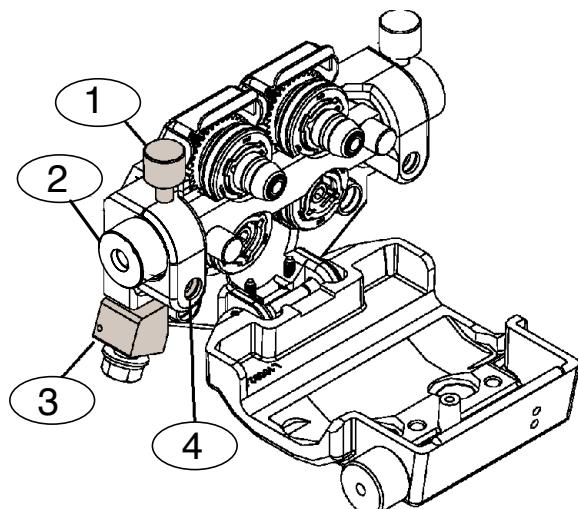
CHANGING THE GUN RECEIVER BUSHING

Gun receiver bushings make it easy to switch from one gun to another.

Tools required:

1/4" Allen wrench

FIGURE A.5



ITEM	DESCRIPTION
1	Thumb Screw
2	Gun Receiver Bushing
3	Connector Bar
4	Socket Head Cap Screw

To change the gun bushing:

1. Turn off power at the welding power source.
2. Remove the welding wire from the wire drive.
3. Remove the thumb screw from the wire drive.
4. Remove the welding gun from the wire drive.
5. Loosen the socket head cap screw that holds the connector bar against the gun bushing. Important: Do not attempt to completely remove the socket head cap screw.
6. Remove the outer wire guide, and push the gun bushing out of the wire drive. Because of the precision fit, light tapping may be required to remove the gun bushing.
7. Disconnect the shielding gas hose from the gun bushing, if required.
8. Connect the shielding gas hose to the new gun bushing, if required.
9. Rotate the gun bushing until the thumb screw hole aligns with the thumb screw hole in the feed plate. Slide the gun receiver bushing into the wire drive and verify the thumb screw holes are aligned.
- Note:** Some gun bushings do not require the use of the thumb screw.
10. Tighten the socket head cap screw.
11. Insert the welding gun into the gun bushing and tighten the thumb screw.

Gun Receiver Bushing	For use With
K1500-1	K466-1 Lincoln gun connectors; Innershield and Subarc guns)
K1500-2	K466-2, K466-10 Lincoln gun connectors; Magnum 200/300/400 guns and compatible with Tweco® #4)
K1500-3	K1637-7 Lincoln gun connectors; Magnum 550 guns and compatible with Tweco® #5)
K1500-4	K466-3 Lincoln gun connectors; compatible with Miller® guns.)
K1500-5	(Compatible with Oxo® guns.)
K489-7	(Lincoln Fast-Mate guns.)

WELDING GUNS, TORCHES AND ACCESSORIES

GUN RECEIVER BUSHING

The Power Feed™ 10M Single Wire Feeder comes with a K1500-2 gun receiver bushing, for use with the Magnum gun with a K466-10 connector kit which .

The Power Feed™ 10M Single Wire Feeder Push Pull model comes with a S25398 gun receiver bushing, for use with the push pull gun. K2154-1 push-pull torch connector kit is optional.

The bushing must be changed if the Power Feed™ 10M Single Wire Feeder is going to be switched from the push set up to the push-pull set up or vice versa.

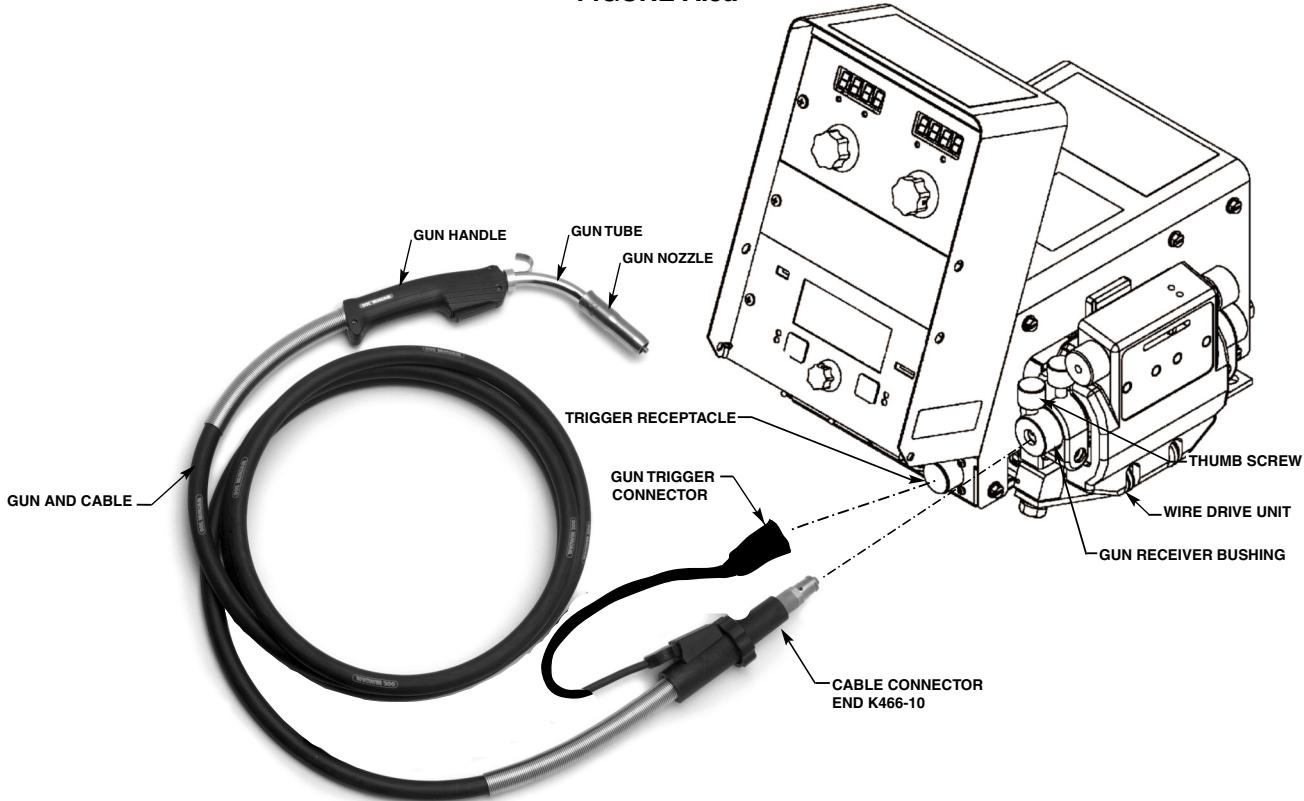
Spool Guns are not recommended with the Power Feed™ 10M Single Wire Feeder.

MAGNUM GUN AND CABLE ASSEMBLIES

The Power Feed™ 10M Single Wire Feeder model will accept a number of optional gun and cable assemblies. An example of installing the Gun and Cable is shown in Figure A.5a with a 15 ft. (4.6m) long Magnum gun and cable.

1. Turn off power at the welding power source.
2. Unscrew Thumb screw on Wire Drive Unit, until tip of screw no longer protrudes into gun bushing hole as seen from the front of machine.
3. Fully insert the gun cable connector end into the gun receiver bushing and gently tighten the thumb screw as show in Figure A.5a below.
4. Connect the gun trigger connector to the trigger receptacle. Make sure that the key ways are aligned, insert and tighten retaining ring.

FIGURE A.5a



WIRE FEED SHUT DOWN CIRCUIT

The wire feed shut down circuit is used to stop the wire feed in the event of a fault. The most common use of the circuit is with water cooled guns. A flow sensor is connected to the circuit to protect the welding gun if the water flow is interrupted.

The Power Feed™ 10M Single Wire Feeder has two leads, 570A and 570B, located inside the wire drive that are electrically common. If flow switch is used, separate these leads and connect to normally closed flow switch terminals when water is flowing. Connect the flow sensor to these two leads.

CHANGING THE GEAR RATIO

The Power Feed™ 10M Single Wire Feeder wire drive may be configured for either low speed or high speed, depending upon the application. The wire feeders are factory assembled for low speed operation and include a gear for high speed operation.

Gear Ratio	Purpose:	Speed	Wire Size	
			Solid	Core
Low Speed	Best for most GMAW and FCAW welding. The low speed gear ratio provides the most force for pushing wires through long guns or pulling wire through conduits.	50-800 ipm (1.27-20.3 m/m)	.025-3/32 in. (0.6 - 2.4 mm)	.035 - .120 in. (0.9 - 3.0 mm)
High Speed	Suitable only for small diameter wires operating at high wire feed speeds. Feeding force is less.	75-1200 ipm (2.03-30.5 m/m)	.025-1/16 in (0.6 - 1.6 mm)	.035 - 5/64 in. (0.9 - 2.0 mm)

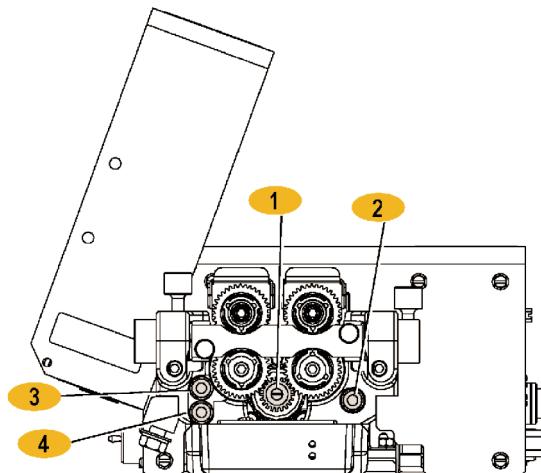
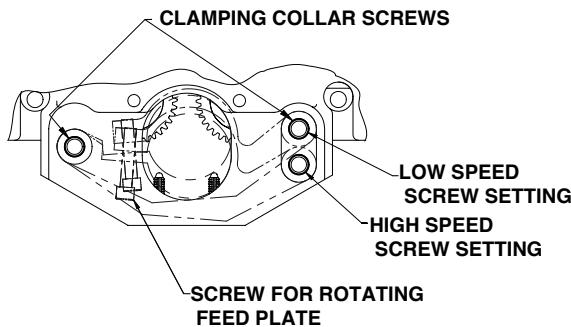


FIGURE A.6

ITEM	DESCRIPTION
1	Gear.
2	Screw holding feed plate to wire feeder.
3	Low speed position, screw holding feed plate to wire feeder.
4	High speed position, screw holding feed plate to wire feeder.

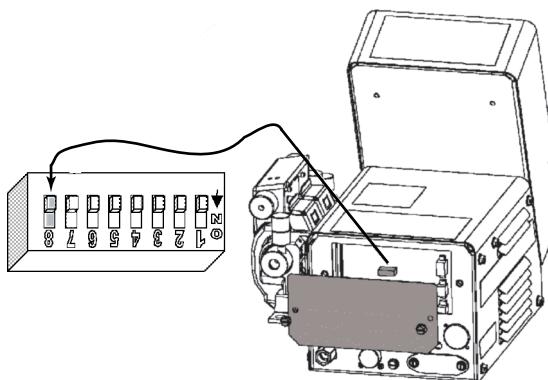
To change the gear ratio:

1. Turn off power at the welding power source.
2. Open the wire drive door.
3. Use a 3/16" Allen wrench to remove the screws holding the feed plate to the wire feeder.
4. Use a Phillips screwdriver to remove the screw and washers holding the gear to the shaft.
5. Remove the gear.
6. Lightly cover the shaft with engine oil or equivalent. Install the desired gear onto the shaft.
7. Reassemble the screw and washers securing the gear to the shaft.
8. Reassemble the screws in the appropriate position for holding the feed plate to the wire feeder.



9. Loosen the two screws on the bottom of the feed plate clamping collar.
10. Rotate the feed plate to the desired position.
11. Tighten the two screws on the bottom of the feed plate clamping collar.

FIGURE A.7



DIP Switch #8 Position	Gear Ratio
ON	High speed
OFF	Low speed (default)

12. Remove the rear access panel on the wire drive.
13. Locate DIP switches on the Wire Drive Board.
14. Set DIP switch #8 to the desired polarity.
15. Reinstall the rear access panel to the wire drive.
16. Restore power.

WIRE REEL LOADING

Spindle Placement

The wire reel stand provides two mounting locations for the spindle. Each mounting location consists of a tube in the center of the mast and locating slots.

Loading 16 to 44 lb. (7.3 – 20kg) Spools

1. Squeeze the release bar on the retaining collar and remove it from the spindle.
2. Place the spool on the spindle, aligning the spindle brake pin with one of the holes in the back side of the spool. An indicator mark on the end of the spindle shows the orientation of the brake holding pin. Be certain the wire feeds off of the spool in the proper direction.
3. Re-install the retaining collar. Make sure that the release bar snaps out and that the retaining collar fully engages the groove on the spindle.

Loading 10 to 15 lb. (4.5 – 6.8kg) Spools

A K419 spindle adapter is required for loading 2" wide spools on 2" (51mm) spindles. Use a K419-1 spindle adapter for loading 2-1/2" (64mm) wide spools.

1. Squeeze the release bar on the retaining collar and remove it from the spindle.
2. Place the spindle adapter on the spindle, aligning the spindle brake pin with the hole in the adapter.
3. Place the spool on the spindle and align the adapter brake tab with one of the holes in the back side of the spool. An indicator mark on the end of the spindle shows the orientation of the brake tab. Be certain the wire feeds off of the spool in the proper direction.
4. Re-install the retaining collar. Make sure that the release bar snaps out and that the retaining collar fully engages the groove on the spindle.

Using K1504-1 Coil Reel

50-60 lb. (22.7 - 27.2 kg) Coil Mounting

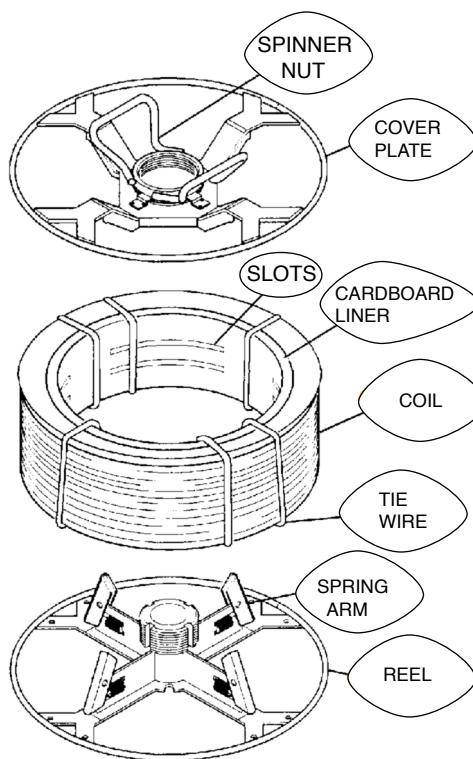
(See Figure A.10)

1. Make sure the spindle of the wire reel stand is in the upper position.
2. With the coil reel assembly mounted to a 2" (51mm) spindle, loosen the spinner nut and remove the cover plate. Alternatively, lay the coil reel assembly flat on the floor and loosen the spinner nut and remove the cover plate.
3. Place the coil of electrode on the reel so it unwinds from the bottom as it rotates.
4. Tighten the spinner nut as much as possible by hand using the cover plate spokes for leverage. DO NOT hammer on the spinner nut.
5. Cut and remove only the tie wire holding the free end of the coil. Hook the free end around the rim of the cover plate and secure it by wrapping it around. Cut and remove remaining tie wires.

! CAUTION

• Always be sure the free end of the coil is securely held while the tie wires are being cut and until the wire is feeding through the drive rolls. Failure to do this will result in "backlashing" of the coil, which may tangle the wire. A tangled coil will not feed and must either be untangled or discarded.

6. Be sure the coil is engaged with the spindle brake pin and the release bar on the retaining collar "pops up". The retaining collar must fully engage the retaining groove on the spindle.

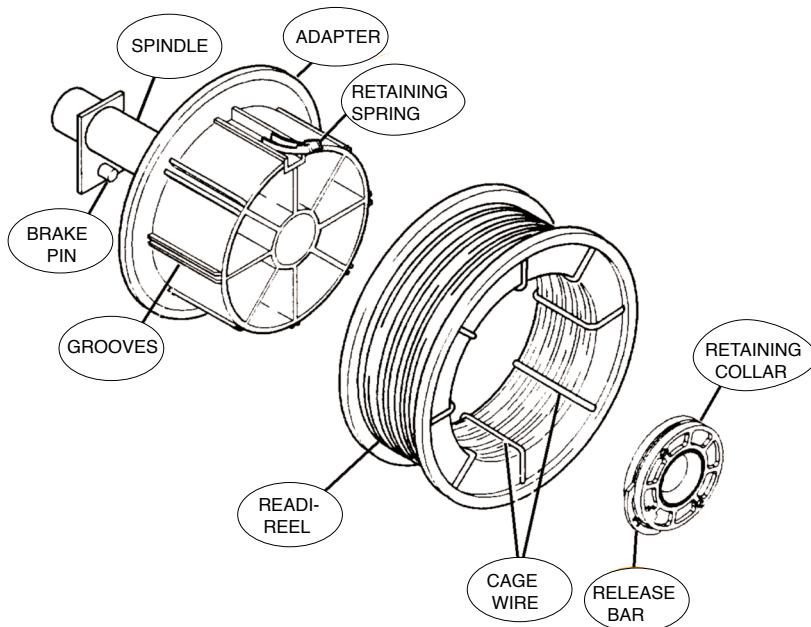
FIGURE A.10

Loading 30 lb. (13.6 kg) Readi-Reels

(See Figure A.11)

A K363-P Readi-Reel adapter is required for loading these spools on 2" (51mm) spindles.

1. Squeeze the release bar on the retaining collar and remove it from the spindle.
2. Place the Readi-Reel adapter on the spindle, aligning the spindle brake pin with one of the holes in the adapter.
3. Re-install the retaining collar. Make sure that the release bar snaps out and that the retaining collar fully engages the groove on the spindle.
4. Rotate the spindle and adapter until the retaining spring is at the 12 o'clock position.
5. Position the Readi-Reel so that electrode de-reels in the proper direction.
6. Set one of the Readi-Reel inside cage wires on the slot in the retaining spring.
7. Lower the Readi-Reel to depress the retaining spring and align the other inside cage wires with the grooves in the adapter.
8. Slide the cage all way onto the adapter until the retaining spring "pops up" fully.

FIGURE A.11**Removing a Readi-Reel**

1. To remove a Readi-Reel from the an adapter, depress the retaining spring with a thumb while pulling the Readi-Reel cage from the adapter with both hands. Do not remove the adapter from the spindle.

WELD WIRE ROUTING

The electrode supply may be either from reels, Readi-Reels, spools, or bulk packaged drums or reels. Observe the following precautions:

- a) The electrode must be routed to the wire drive unit so that the bends in the wire are at a minimum, and also that the force required to pull the wire from the reel into the wire drive unit is kept at a minimum.
- b) The electrode is "hot" when the gun trigger is pressed and must be insulated from the boom and structure.
- c) If more than one wire feed unit shares the same boom and are not sharing the same power source output stud, their wire and reels must be insulated from each other as well as insulated from their mounting structure.

SHIELDING GAS CONNECTION

NOTE: Gas supply pressure must be regulated to a maximum of 80 psi(5.5 bar).

Install the shielding gas supply as follows:

1. Secure the cylinder to prevent it from falling.
2. Remove the cylinder cap. Inspect the cylinder valves and regulator for damaged threads, dirt, dust, oil or grease. Remove dust and dirt with a clean cloth. DO NOT ATTACH THE REGULATOR IF OIL, GREASE OR DAMAGE IS PRESENT! Inform your gas supplier of this condition. Oil or grease in the presence of high pressure oxygen is explosive.
3. Stand to one side away from the outlet and open the cylinder valve for an instant. This blows away any dust or dirt which may have accumulated in the valve outlet.
4. Attach the flow regulator to the cylinder valve and tighten the union nut(s) securely with a wrench. Note: if connecting to 100% CO₂ cylinder, insert regulator adapter between regulator and cylinder valve. If adapter is equipped with a plastic washer, be sure it is seated for connection to the CO₂ cylinder.
5. Attach one end of the inlet hose to the outlet fitting of the flow regulator. Attach the other end to the welding system shielding gas inlet. Tighten the union nuts with a wrench.
6. Before opening the cylinder valve, turn the regulator adjusting knob counterclockwise until the adjusting spring pressure is released.
7. Standing to one side, open the cylinder valve slowly a fraction of a turn. When the cylinder pressure gage stops moving, open the valve fully.
8. The flow regulator is adjustable. Adjust it to the flow rate recommended for the procedure and process being used before making a weld.

EXAMPLES OF CONNECTING AN ARCLINK POWER WAVE SYSTEM

ArcLink Power Wave products may be configured in many different ways. The flexible system allows multiple wire feeders to be connected to the same power source. The diagrams represent some of the common methods for connecting ArcLink Products.

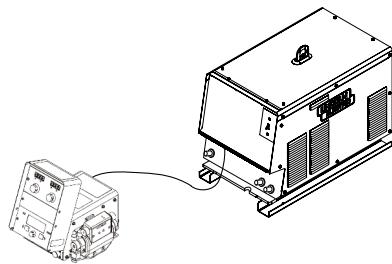
Important: Bench model wire feeders cannot be separated into a separate control box and wire drive for a boom system.

Common ArcLink Systems

The following Power Wave systems may all be assembled without any changes to the equipment DIP switches

Basic Semi-Automatic System

- Great for general fabrication.

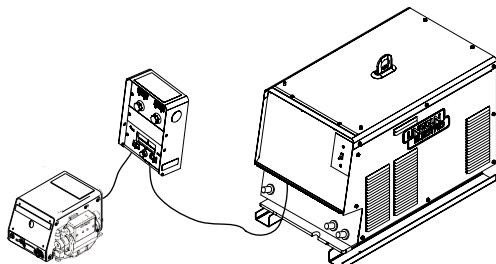


Shown with

- K2230-1 Power Feed™ 10M Single Wire Feeder
- K2203-1 Power Wave 455M/STT

Boom Semi-Automatic System

- Often used when making large weldments.

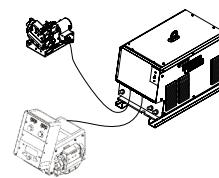


Shown with

- K2314-1 Power Feed™ 10M Single Wire Feeder Boom (includes wire drive and control box)
- K2203-1 Power Wave 455M/STT

Robotic/Semi-Automatic System

- Use the bench feeder for offline welding.

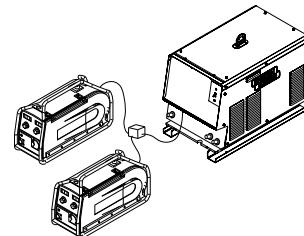


Shown with

- K2230-1 Power Feed™ 10M Single Wire Feeder
- K1780-2 PF-10/R
- K2203-1 Power Wave 455M/STT
- K2205-1 Wire Drive Module

Multiple Wire Feeder System

- Load one feeder with solid wire, the other with flux cored.



- Great for pipeline work.

Shown with

- K2429-1 ArcLink T Cable Connector
- K2196-1 Power Feed 15M
- K2203-1 Power Wave 455M/STT

ArcLink Systems

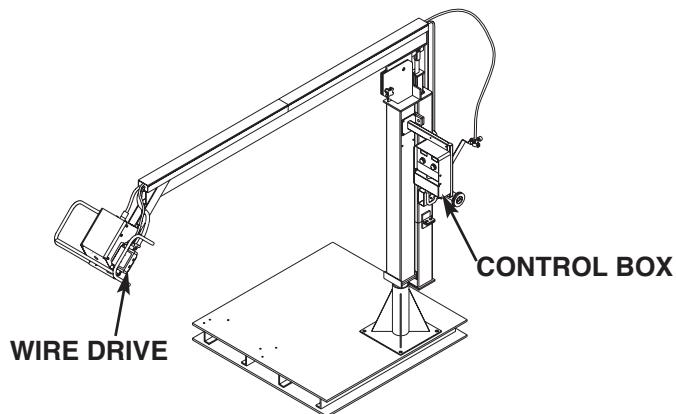
Many other ArcLink systems may be assembled besides those shown in this manual. The majority will self configure. If an assembled system flashes the status light green rapidly on all components, contact the Lincoln Electric Company for further assistance.

Current Power Feed™ 10M models that will not self configure...

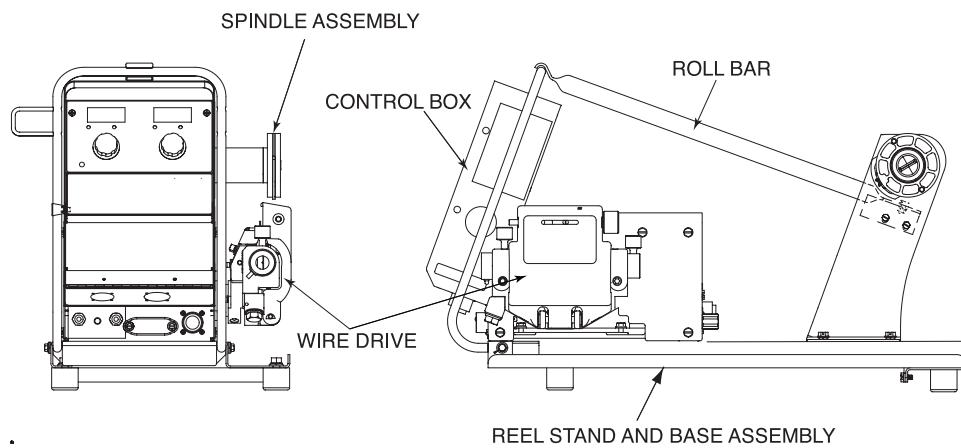
- K2316-1 Power Feed™ 10M Dual Boom

These configurations will require Dip Switches to be set. See the power source instruction manual on how to disable self configuration.

BOOM CONFIGURATION



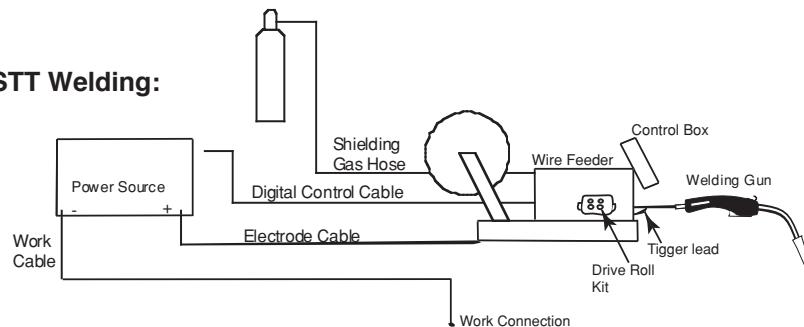
BENCH MODEL FEATURES



BASIC Power Feed™ 10M Single Wire Feeder WELDING SYSTEM CONFIGURATION

CV Welding:

Pulse Welding or STT Welding:



SAFETY PRECAUTIONS

Read this entire section of operating instructions before operating the machine.

**ELECTRIC SHOCK can kill.**

- Do not touch electrically live parts or electrodes with your skin or wet clothing.
- Insulate yourself from the work and ground.
- Always wear dry insulating gloves.
- Do not use AC welder if your clothing, gloves or work area is damp or if working on, under or inside work-piece.



Use the following equipment:

- DC manual (stick) welder.
- AC welder with reduced voltage control.

- Do not operate with panels removed.
- Disconnect input power before servicing.

**READ THIS WARNING, PROTECT
YOURSELF & OTHERS.**

**FUMES AND GASES can be
dangerous.**

- Keep your head out of fumes.

- Use ventilation or exhaust at the arc, or both,to keep fumes and gases from your breathing zone and general area.

**WELDING SPARKS can cause fire
or explosion.**

- Do not weld near flammable material.
- Do not weld on containers which have held flammable material.

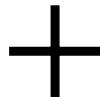
**ARC RAYS can burn.**

- Wear eye, ear, and body protection.

**ONLY QUALIFIED PERSONS SHOULD INSTALL,
USE OR SERVICE THIS EQUIPMENT. READ AND
FOLLOW THE MANUFACTURER'S INSTRU-**

**GRAPHIC SYMBOLS THAT APPEAR ON
THIS MACHINE OR IN THIS MANUAL**

WIRE FEEDER



POSITIVE OUTPUT



NEGATIVE OUTPUT



**PROTECTIVE
GROUND**



**WARNING OR
CAUTION**

DEFINITIONS OF WELDING MODES**NON-SYNERGIC WELDING MODES**

- A **Non-synergic** welding mode requires all welding process variables to be set by the operator.

SYNERGIC WELDING MODES

- A **Synergic** welding mode offers the simplicity of single knob control. The machine will select the correct voltage and amperage based on the wire feed speed (WFS) set by the operator.

COMMON WELDING ABBREVIATIONS**WFS**

- Wire Feed Speed

CC

- Constant Current

CV

- Constant Voltage

GMAW (MIG)

- Gas Metal Arc Welding

GMAW-P (MIG)

- Gas Metal Arc Welding-(Pulse)

GMAW-PP (MIG)

- Gas Metal Arc Welding-(Pulse-on-Pulse)

GTAW (TIG)

- Gas Tungsten Arc Welding

SMAW (STICK)

- Shielded Metal Arc Welding

FCAW (Innershield or Outershield)

- Flux Core Arc Welding

HF

- High Frequency

CAG

- Carbon Arc Gouging

PRODUCT DESCRIPTION**General Physical Description**

The Power Feed™ 10M Single Wire Feeder is a modular wire feeder, consisting of two components - a **wire drive** and a **control box** - are available assembled as a **bench unit** or as a **boom system**. High speed, highly reliable digital cables connect the components together and to the Power Wave power source.

The Power Feed™ 10M Single Wire Feeder system has the ability to connect multiple wire feeders to one power source, use the same power source to weld in two different locations (not simultaneously), or load a different electrode on each feeder to eliminate change over time.

The powerful four roll wire drive system sets the industry standard for ease of use. Its patented design allows for tool-less change out of wire guides and drive rolls greatly reducing set up time.

General Functional Description

- The Power Feed™ 10M Single Wire Feeder is a highly versatile wire feeder with easy to use features that make it easy for the operator to adjust the arc for specific preferences.
- The new MSP4 panel clearly displays key welding information. Use the MSP4 panel to quickly adjust weld settings, arc starting parameters, arc end parameters and set-up variables.
- The Power Feed™ 10M Single Wire Feeder wire feeder is provided with an infrared red (IR) port. Transferring welding settings from one wire feeder to another is accomplished with a common palm computer.
- When the Power Feed™ 10M Single Wire Feeder is coupled to a Power Wave welding power source, the result is a welding system with absolutely superior arc performance.

RECOMMENDED PROCESSES

The Power Feed™ 10M Single Wire Feeder is well suited for all MIG welding processes, giving premium arc performance especially with unusual alloys and out of position work.

- | | |
|--|--|
| <ul style="list-style-type: none"> • GMAW • GMAW-Pulse • GMAW-STT • FCAW | <ul style="list-style-type: none"> • SMAW • GTAW (Touch Start TIG only) • CAG |
|--|--|

PROCESS LIMITATIONS

The Power Feed™ 10M Single Wire Feeder is not suitable for:

- SAW
- GTAW with HF

Not all weld modes or processes described in this manual are available on all Power Wave power sources.

REQUIRED EQUIPMENT

Lincoln's Power Feed™ 10M Single Wire Feeder is designed for use with the Power Wave family of power sources. These include:

- Power Wave 355 • Power Wave 455M CE
- Power Wave 455 • Power Wave 455M STT
- Power Feed 455/STT • Power Wave 455M STT CE
- Power Wave 455M • Power Wave 655

ADDITIONAL REQUIRED EQUIPMENT

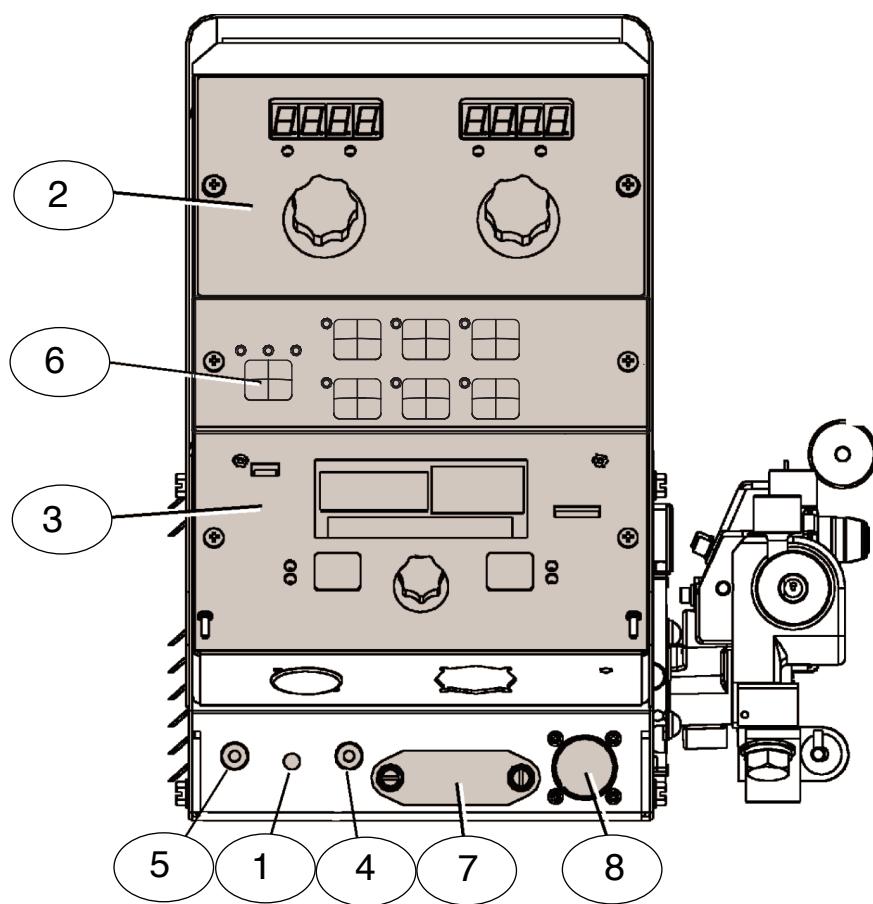
- Drive Roll Kits
- Control Cables
- Gun and Cable Assembly
- Weld Wire
- Shielding gas
- Work Cable and Clamp

EQUIPMENT LIMITATIONS

- The Power Feed™ 10M Single Wire Feeder does not operate with the Power Wave 450.
- The Power Feed™ 10M Single Wire Feeder does not operate with any analog based power sources (CV-xxx machines, DC-xxx machines, etc.)
- The Memory Panel is required to set procedure limits.
- The Boom model does not support push-pull guns or GTAW welding.
- A push-pull gun and foot amptrol may not be plugged into the Power Feed™ 10M Single Wire Feeder at the same time.

FRONT PANEL CONTROLS AND CONNECTIONS

CASE FRONT CONTROLS

FIGURE B.1

ITEM	DESCRIPTION
1	Status LED indicates system status.
2	Digital Meter Display is a bright LED display of key welding information. Adjusting Parameter Knobs.
3	MSP4 Panel is used to set the weld mode, adjust the arc, change arc start/end parameters and for set-up information.
4	Cold Feed - Gas Purge Switch, press the switch up to feed wire with weld output off. Press the switch down for gas flow with weld output off.
5	2 step - 4 step Switch is used to choose between a 2 step trigger or a 4 step trigger operation.
6	Memory Panel. Operating Instructions are located in this Operation Section if your machine is equipped with this unit. If not equipped you may order K2360-1 Field-Installed option (See Accessories Section). (Memory Panel are for Codes 11771, 11772 and above)
7	Cover for Optional Water Cooling Kit, remove when the water cooling kit is installed. See instructions with water cooling Kit.
8	Trigger Connector 5-pin amphenol for connecting the MIG gun trigger. See Installation Section for detail.

1. STATUS LED

The status LED indicates system status. Normal operation is a steady green light.

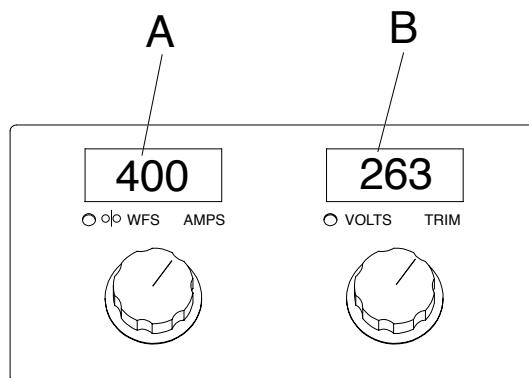
Note: During normal power-up, the LED may flash red and/or green as the equipment performs self tests.

LED condition	Definition
Steady green	System okay. The power source and wire feeder are communicating normally.
Blinking green	Occurs during a reset and indicates the power source is identifying each component in the system. This is normal for the first 10 seconds after power-up, or if the system configuration is changed during operation.
Alternating green and red	<p>Non-recoverable system fault. If the power source or wire feeder status LED is flashing any combination of red and green, errors are present in the system. Read the error code before the machine is turned off.</p> <p>Instructions for reading the error code are detailed in the Service Manual. Individual code digits are flashed in red with a long pause between digits. If more than one code is present, the codes will be separated by a green light.</p> <p>To clear the error, turn the power source OFF, and then back ON to reset. See troubleshooting section.</p>
Steady red	Non recoverable hardware fault. Generally indicates a problem with the cables connecting the wire feeder to the power source.
Blinking red	Not applicable.

2. DIGITAL METERS AND OUTPUT ENCODER KNOBS (See Figure B.2)

The primary weld procedure settings are controlled and displayed using digital meters and output encoder knobs located at the top of the Power Feed™ 10M Single Wire Feeder control panel.

FIGURE B.2
A. WIRE FEED SPEED/AMMETER DISPLAY AND OUTPUT KNOB



This meter displays either the wire feed speed or current value (Amps) depending upon welding process (Mode) being used and the status of the wire feeder and power source. Written below the display is "WFS" and "Amps". An LED light illuminates which value is being displayed on the meter. The knob below the meter adjusts the value displayed on the meters.

Prior to Welding	Description
CV Welding Processes	Meter displays the preset WFS value.
CC Welding Processes	Meter displays the preset Amps.
During Welding	
An Weld Processes	Meter displays displays the actual average welding Amps.
After Welding	
An Weld Processes	The meter holds the actual current value for 5 seconds. The display blinks to indicate the Power Feed™ 10M Single Wire Feeder is in the "Hold" period. If the output is adjusted while in the "Hold" period, the Power Feed™ 10M Single Wire Feeder will revert to the "Prior to welding" display described above.

Note: If the output knob for the WFS/AMPS is adjusted while the Power Feed™ 10M Single Wire Feeder is in the "Hold" period, the Power Feed™ 10M Single Wire Feeder will immediately revert to the "Prior to Welding" display.

The default wire feed speed units are inches/minute and can be changed to meters/minute by entering the "Set-up Menu" in this Operation Section. The wire feed speed is calibrated to within $\pm 2\%$. Refer to the power source manual for calibration specifications of the ammeter.

B. VOLTS / TRIM DISPLAY AND OUTPUT KNOB

The voltage/trim meter displays either the voltage or trim value, depending upon the welding process (mode) being used and the status of the wire feeder and power source.

Below the meter are the words "Volts" and "Trim". An LED light illuminates to designate which value is being displayed on the meter. The knob below the meter adjusts the value displayed in the meter. The following tables describe the function of the Volts / Trim display depending upon the status of the wire feeder / power source package and the welding process utilized.

PRIOR TO WELDING

Weld Process	Volts / Trim Display prior to operation
Nonsynergic CV	Displays the preset Voltage value.
Synergic CV	Displays the preset Voltage value.
Synergic CV-Pulse	Displays the preset Trim value from 0.50 to 1.50, with 1.00 as the default. Trim adjusts the arc length for Pulse programs. Lower the trim value to decrease the arc length, and raise the trim value to increase the arc length. A trim value of 1.00 is optimum for most conditions.
Synergic CV-STT	<ul style="list-style-type: none"> Adjusts the background current of the STT waveform. Used to modify the heat input. Linc Net Power Sources: Displays the background current as a value from 0.50 to 1.50, with 1.00 as the default. Lower the trim value to decrease the heat input, and raise the trim value to increase the heat input. A trim value of 1.00 is optimum for most conditions. Arc Link Power Sources: Displays the background current in amps. Lower the background current to decrease the heat input and raise the background current to increase the heat input.
Nonsynergic Power	Displays the preset CP value from 0 to 20. The Power mode is best for thin sheet metal and aluminum applications.

DURING WELDING

Weld Process	Volts / Trim Display
All Processes	Displays Actual Average Arc Voltage

AFTER WELDING

Weld Process	Volt/Trim Display
All Processes	After welding, the meter holds the actual average arc voltage for 5 seconds. During this time, the display flashes to indicate the wire feeder is in the "Hold" period. Output adjustment while in the "Hold" period results in the "prior to operation" characteristics described above.

SYNERGIC CV VOLTAGE DISPLAY

Synergic CV programs feature an ideal voltage best suited for most procedures. Use this voltage as a starting point for the weld procedure and adjust if needed for personal preferences.

The voltage is calibrated to $\pm 2\%$ over a range of 10 to 45 volts.

When the voltage knob is rotated, the display will show an upper or lower bar indicating if the voltage is above or below the ideal voltage.

- Preset voltage above ideal voltage. (upper bar displayed)



- Preset voltage at ideal voltage. (no bar displayed)



- Preset voltage below ideal voltage. (lower bar displayed)

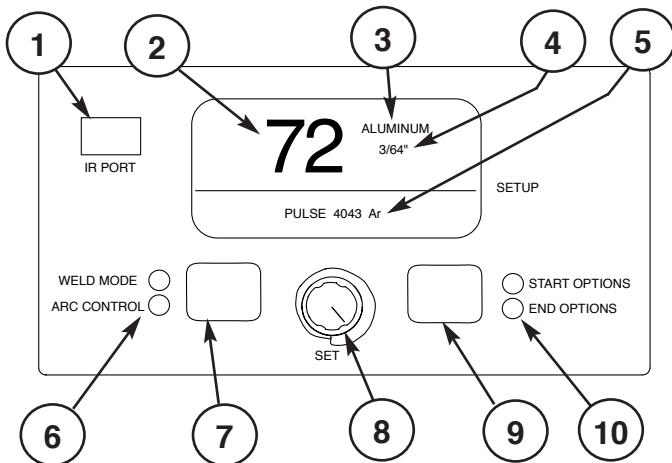


OVERVIEW:

The MSP4 is the standard mode select panel for the Power Feed™ 10M Single Wire Feeder wire feeders. The MSP4 is capable of:

- Weld mode selection.
- Arc Control adjustment.
- Weld sequence control (Preflow Time, Run-in WFS, etc.)

FIGURE B.3

**3. MODE SELECT PANEL 4 (MSP4)**

ITEM	DESCRIPTION
1	IR (Infrared) Port.
2	Weld Mode Number.
3	Weld Wire Type.
4	Wire Size.
5	Weld Mode Description.
6	Status LED Lights-Weld Mode/Arc Control.
7	Selection Pushbutton Weld Mode or Arc Control.
8	"Set" (Adjustment) Dial / Knob
9	Selection Pushbutton Start and End Options.
10	Status LED Lights-Start/End Options.

Through the use of alphanumeric displays, the MSP4 provides standard text messages designed to enhance the user's understanding of the machine's operation as well as provide advanced capabilities. The panel provides:

- Clear identification of the selected weld mode.
- Identification of weld modes not listed on the preprinted weld mode list label.
- Control of up to four wave controls (arc controls.)
- Weld mode specific wave control name display (Peak, Background, Pinch, etc.).
- Unit values are displayed (Amps, in/min, etc.).
- User-friendly machine setup and configuration.

- Limit setting for restricting the operators range of control.

- Lockout to prevent unauthorized changes to machine configuration.

Additionally, the MSP4 includes an infrared (IR) port for wireless communication and configuration using a Palm OS based hand held computer and a simplified control layout.

**LAYOUT-CONTROLS
(SEE FIGURE B.3)**

The MSP4 panel controls (Items 7 and 9) set consist of an encoder knob Item 8 and two push buttons. The encoder is primarily used to change the value of the selected attribute.

The left pushbutton (Item 7) is used to toggle between Weld Mode selection and any active Arc Controls (a.k.a. wave controls). The choices of wave controls varies by weld mode. For example, weld mode 31 has one wave control, "Pinch". Weld mode 110 has three wave controls, "Peak Current", "Background Current" and "Tailout". If the selected weld mode has no wave controls, pressing the left pushbutton will have no affect. If the selected weld mode uses one or more wave controls, pressing the left pushbutton will sequence the selection from weld mode -> wave control 1 (if active) -> wave control 2 (if active) -> wave control 3 (if active) -> wave control 4 (if active) then back to weld mode.

The right pushbutton (Item 9) is used to select attributes that affect the available weld parameters such as preflow time, burnback time, etc. Since most users will require infrequent access to these attributes, they are separate from weld mode selection and wave control adjustment.

LAYOUT-DIGITAL DISPLAY

The MSP4 display consists of a large 4-digit, 7-segment LED display, two 8-character alphanumeric LED displays and one 16-character alphanumeric LED display. The information shown on the various displays depends on the state of the user interface as described below.

When the MSP4 is being used to select a weld mode, the 4-digit display (Item 2) indicates the selected weld mode number. The upper 8-character alphanumeric display (Item 3) indicates the electrode type (steel, aluminum, etc.) The lower 8-character alphanumeric display (Item 4) indicates the electrode size (.035", 1/16", etc.).

The 16-character alphanumeric display (Item 5) indicates the process type and other information, the exact content of which depends on the selected weld mode. This additional information may include specific electrode type (e.g. 4043) and/or a description of the recommended gas (e.g. HeArCO₂).

When the MSP4 is being used to change the value of an attribute, the 7-segment displays show the selected attribute's value. The upper 8-character alphanumeric display is typically not used while changing an attribute's value. The lower 8-character alphanumeric display is used to indicate the units of the selected attribute (e.g. seconds, in/min, etc.). The 16-character alphanumeric display is used to display the name of the selected attribute.

The content of the displays while the user interface is being used for advance machine configuration (e.g. limit setting, pass code entering, machine setup, etc.) is described in later sections.

POWER-UP SEQUENCE

When power is first applied to the machine, a lamp test is performed. All discrete LED's are turned on, all 7-segment displays will show a pattern of "8." and all alphanumeric displays will show a hatch pattern where every-other pixel is illuminated. The lamp test will last for two seconds, after which all displays are turned back off. The 16-character alphanumeric display will show "Initializing..." while waiting for the Weld Sequencer to announce bus available. The MSP4 alphanumeric displays will then display the name of the weld table loaded in the power source while the user interface prepares the machine for operation. After all initialization is complete, the MSP4 will display the weld mode information for the mode number that was selected when the machine was last powered down.

CHANGING WELD MODES

To select a weld mode, press the left MSP4 pushbutton until the WELD MODE LED is illuminated. Turn the MSP4 encoder until the desired weld mode number is displayed. As the MSP4 encoder knob is rotated, only the weld mode number is displayed. After 1 second of encoder idle time, the user interface will change to the selected weld mode and the new mode's electrode type, electrode size and process information will appear.

CHANGING ARC WAVE CONTROL

If the selected weld mode uses any of the four available wave controls, users can press the left MSP4 pushbutton until the ARC CONTROL LED is illuminated. The value, name and units (if applicable) of the available wave controls will appear. Note that the name of the control is derived from the weld table and may not necessarily appear as "Wave Control". Repeated pressing of the left MSP4 pushbutton will cycle through all active wave controls and then the weld mode. Turning the MSP4 encoder will change the value of the displayed wave control.

CHANGING WELD SEQUENCE BEHAVIOR

Weld sequencing attributes are grouped into two categories, START OPTIONS and END OPTIONS. START OPTIONS may include Preflow Time, Run-in Wire Feed Speed, and Start Time. END OPTIONS may include Spot Timer, Crater Time, Burnback Time and Postflow Time. The attributes that appear in the START and END OPTIONS are weld mode dependent. For example, if a TIG weld mode is selected, Run-in WFS will not appear since it is not relevant to the selected process. Repeated pressing of the right MSP4 pushbutton will cycle through all relevant START and END OPTIONS. Turning the MSP4 encoder will change the value of the selected option.

When the Start Time attribute is set to a value other than OFF, the START OPTIONS LED will blink synchronously with the WFS and VOLTS/TRIM LED's on the dual-display panel. This blinking is used to indicate that start wire feed speed and voltage/trim can now be set to values different from those used while welding. Similarly, if the Crater Time attribute is set to a value other than OFF, the END OPTIONS LED will blink synchronously with the dual-display LED's, indicating that crater wire feed speed and voltage/trim now can be set to values different from those used while welding.

INFRARED (IR) CONTROL

The MSP4 interface includes an infrared transceiver. This allows wireless machine configuration using a Palm OS based hand held computer. A proprietary Palm OS application, Weld Manager, was developed for this purpose. (Contact Lincoln Electric for more information on this feature.)

LOCKOUT/SECURITY

The MSP4 can be optionally configured to prevent the welder from changing selected user interface controls. By default, all user interface controls can be changed. Weld Manager software (for Palm OS or PC) must be used to lock or unlock user interface controls and to set a pass code.

LIMIT SETTING

The MSP4 can be optionally configured to limit the operator's range of control of any weld parameter (weld WFS, arc control, etc.). Limits are only available with the Dual Procedure/Memory Panel.

MACHINE SETUP/USER PREFERENCES

The MSP4 can be used to configure and troubleshoot the machine.

ACCESSING THE MACHINE SETUP MENU

To access the Machine Setup menu, press both MSP4 push buttons simultaneously. The MSP4 7-segment display will display the first user preference, "P.0", and the SETUP LED will illuminate.

- Pressing the left MSP4 pushbutton will exit the entire Machine Setup menu while in the P.0 user preference.
- Turning the MSP4 encoder knob will select other available User Preferences.
- To exit the User Preference Menu, either rotate the MSP4 encoder until P.0 is displayed and press the left MSP4 pushbutton or press both MSP4 push buttons simultaneously at any time.

SET-UP FEATURES MENU

The Setup Menu gives access to the Setup Configuration. Stored in the setup configuration are user parameters that generally only need to be set at installation. The parameters are grouped as shown in the following table.

PARAMETER	DEFINITION
P.1 through P.99	Unsecured Parameters (always adjustable)
P.100 through P.107	Diagnostic Parameters (always read only)

SET-UP FEATURES MENU

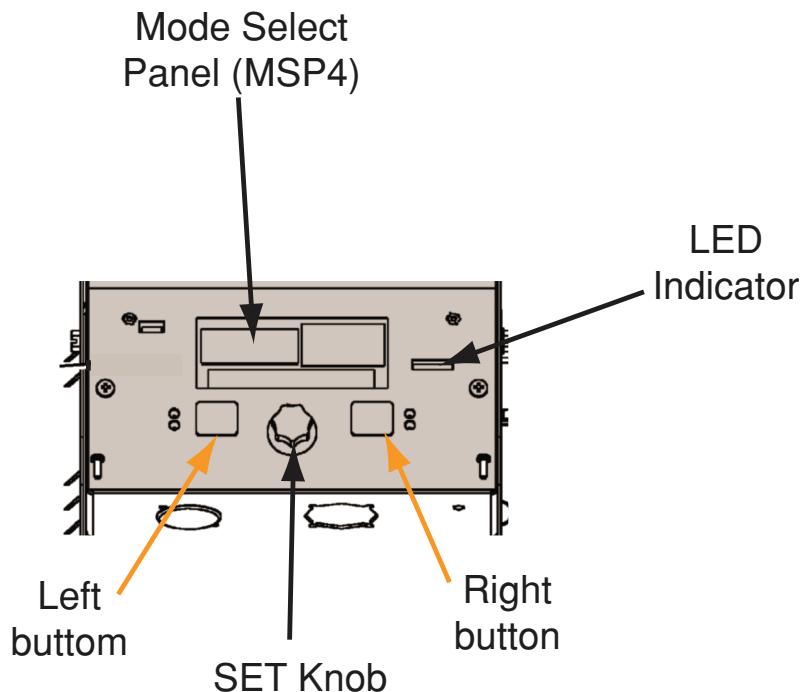
(See Figure B.3a)

1. To access the set-up menu, press the **Right** and **Left** buttons of the **MSP4** panel simultaneously. **Note** that the set-up menu cannot be accessed if the system is welding, or if there is a fault (The status **LED** is not solid green).

Change the value of the blinking parameter by rotating the **SET** knob.

2. After changing a parameter it is necessary to press the **Right** hand button to save the new setting. Pressing the **Left** button will cancel the change.
3. To exit the set-up menu at any time, press the **Right** and **Left** buttons of the MSP4 panel simultaneously. Alternately, 1 minute of inactivity will also exit the set-up menu.

FIGURE B.3a - SETUP MENU



USER DEFINED PARAMETERS

Parameter	Definition
P.0	Exit Setup Menu This setup menu parameter can be used to exit the setup menu. When P.0 is displayed, press the left Mode Select button to exit the setup menu.
P.1	Wire Feed Speed Units P.1 selects which units wire feed speed will be displayed in. English = in/minute wire feed speed units (default). Metric = m/minute wire feed speed units.
P.2	Arc Display Mode P.2 selects what value will be shown on the upper left display while welding. Amps = The left display shows Amperage while welding (default). WFS = The left display shows Wire Feed Speed while welding.
P.3	Display Energy P.3 selects whether or not energy is displayed on the MSP4 while welding. The total energy from the previous weld will persist on the MSP4 display until another weld is started, or a user interface control is changed. P.3 will only show up in the list if the power source is capable of calculating energy (a power source software update may be necessary). When P.3 = No, energy will not be displayed (default). When P.3 = Yes, energy is displayed.
P.4	Recall Memory with Trigger Allows the operator to recall a memory by quickly pulling and releasing the gun trigger. To recall a memory, quickly pull and release the trigger the number of times that correspond to the memory number. For example, to recall memory 3, quickly pull and release the trigger 3 times. To recall memory 1, quickly pull and release the trigger the number of user memories plus 1. Memories cannot be recalled while the system is welding. A memory panel must be installed in order to use this feature. Disabled = The gun trigger cannot be used to recall user memories (default). Enabled = The gun trigger can be used to recall user memories.

Parameter	Definition
P.5	<p>Procedure Change Method</p> <p>Selects how remote procedure selection (A/B) will be made. The selected procedure can be changed locally at the user interface by pressing the 'A-Gun-B' button. The following methods can be used to remotely change the selected procedure:</p> <ul style="list-style-type: none"> • Use an external switch wired to the procedure select input. • Quickly releasing and re-pulling the gun trigger. • Using a dual-schedule gun which incorporates a procedure select switch in the trigger mechanism (pulling the trigger more than half way changes the procedure from A to B). <p>The possible values for this parameter are:</p> <ul style="list-style-type: none"> • External Switch = Procedure selection may only be performed at the memory panel or an external switch (e.g. K683). • Quick Trigger = The selected procedure can be changed remotely by releasing and re-pulling the trigger quickly while welding. This feature is disabled in 4-Step trigger mode. The external procedure switch is disabled. To operate: <ol style="list-style-type: none"> 1. Select "GUN" on the memory panel. 2. Start the weld by pulling the gun trigger. The system will weld with procedure A settings. 3. While welding, quickly release then pull the gun trigger once. The system will switch to procedure B settings. Repeat to switch back to procedure A settings. The procedure can be changed as many times as needed during the weld. Release the trigger to stop welding. The system will automatically return to procedure A settings. • Integral TrigProc = When using a Magnum DS dual-schedule gun (or similar) that incorporates a procedure switch in the gun trigger mechanism. While welding in 2-step, machine operation is identical to the "External Switch" selection. When welding in 4-step, additional logic prevents procedure A from being re-selected when the trigger is released at step 2 of the 4-step weld sequence. The machine will always operate in 2-step if a weld is made exclusively in procedure A, regardless of the 2/4 step switch position (this is intended to simplify tack welding when using a dual-schedule gun in 4-step).
P.6	<p>Stall Factor Adjustment</p> <p>Allows the adjustment of the stall factor in Push/Pull operation. The stall factor controls the stall torque of the push motor when using a push-pull gun. The wire feeder is factory-set to not stall unless there is a large resistance to feeding wire. The stall factor can be reduced to stall more easily and possibly prevent bird nesting. However, low stall factors can cause motor stalling during normal welding conditions, which results in the wire burning back to the tip or rapid tack welds. If you are experiencing bird nests, check for other feeding problems before adjusting the stall factor. The default value for the stall factor is 75, with a range of 5 to 100.</p>

USER DEFINED PARAMETERS

Parameter	Definition
P.7	<p>Gun Offset Adjustment</p> <p>Range: -30 to 30 (default = 0)</p> <p>Adjusts the wire feed speed calibration of the pull motor of a push-pull gun. This should only be performed when other possible corrections do not solve any push-pull feeding problems. An rpm meter is required to perform the pull gun motor offset calibration. To perform the calibration procedure do the following:</p> <ul style="list-style-type: none"> • Release the pressure arm on both the pull and push wire drives. • Set the wire feed speed to 200 ipm. • Remove wire from the pull wire drive. • Hold an rpm meter to the drive roll in the pull gun. • Pull the trigger on the push-pull gun. • Measure the rpm of the pull motor. The rpm should be between 115 and 125 rpm. If necessary, decrease the calibration setting to slow the pull motor, or increase the calibration setting to speed up the motor.
P.8	<p>TIG Gas Control</p> <p>Allows control over which gas solenoid actuates while TIG welding.</p> <ul style="list-style-type: none"> • Valve (manual) = No MIG solenoid will actuate while TIG welding, gas flow is manually controlled by an external valve. • Feeder Solenoid = The internal (feeder) MIG solenoid will turn on and off automatically while TIG welding. • Power source Solenoid = Any gas solenoid connected to the power source will turn on and off automatically while TIG welding. <p>Notes:</p> <ul style="list-style-type: none"> • Preflow is not available while TIG welding. • Postflow is available - the same postflow time will be used in MIG and TIG. • When machine output on/off is controlled via the upper right knob, gas flow will not start until the tungsten touches the work. Gas flow will continue when the arc is broken until the Postflow time expires. • When machine output on/off is controlled via an arc start switch or foot Amptrol, gas will begin flowing when the output is turned on and will continue flowing until the output is turned off and the Postflow time expires.
P.9	<p>Crater Delay</p> <p>Range: Off to 10.0 seconds (default = Off)</p> <p>Used to skip the Crater sequence when making short tack welds. If the trigger is released before the timer expires, Crater will be bypassed and the weld will end. If the trigger is released after the timer expires, the Crater sequence will function normally (if enabled).</p>
P.14	<p>Reset Consumable Weight</p> <p>Only appears in the list with systems using Production Monitoring. Use this option to reset the initial weight of the consumable package. Press the right Mode Select Button to reset the consumable weight.</p>

USER DEFINED PARAMETERS

Parameter	Definition
P.16	<p>Push-Pull Gun Knob Behavior</p> <p>Determines how the potentiometer on the Push/Pull torch will behave.</p> <ul style="list-style-type: none"> • Gun Pot Enabled = The welding wire feed speed is always controlled by the potentiometer on the push-pull gun (default). The left front panel knob is only used to adjust Start and Crater wire feed speed. • Gun Pot Disabled = The wire feed speed is always controlled by the left front panel knob. This setting is useful when the operator wishes to have wire feed speed settings recalled from memories and not have the potentiometer "overwrite" the setting. • Gun Pot Procedure A = When in procedure A, the welding wire feed speed is controlled by the potentiometer on the push-pull gun. When in procedure B, the welding wire feed speed is controlled by the left front panel knob. This setting allows a fixed wire feed speed to be selected in procedure B and not have the potentiometer "overwrite" the setting when procedure changes.
P.20	<p>Display Trim as Volts Option</p> <p>Determines how trim is displayed.</p> <ul style="list-style-type: none"> • False = The trim is displayed in the format defined in the weld set (default). • True = All trim values are displayed as a voltage.
P.22	<p>Arc Start/Loss Error Time</p> <p>Can be used to optionally shut off output if an arc is not established, or is lost for a specified amount of time. Error 269 will be displayed if the machine times out. If the value is set to OFF, machine output will not be turned off if an arc is not established nor will output be turned off if an arc is lost. The trigger can be used to hot feed the wire (default). If a value is set, the machine output will shut off if an arc is not established within the specified amount of time after the trigger is pulled or if the trigger remains pulled after an arc is lost. This is disabled while welding in Stick, TIG or Gouge. To prevent nuisance errors, set Arc Start/Loss Error Time to an appropriate value after considering all welding parameters (run-in wire feed speed, weld wire feed speed, electrical stick out, etc). To prevent subsequent changes to Arc Start/Loss Error Time, the setup menu should be locked out by setting Preference Lock = Yes using the Power Wave Manager software.</p>
P.80	<p>Sense From Studs</p> <p>Use this option for diagnostic purposes only. When power is cycled, this option is automatically reset to False.</p> <ul style="list-style-type: none"> • False = Voltage sensing is determined by the DIP switch configuration and the selected weld mode (default). • True = Voltage sensing is forced to "studs" regardless of the DIP switch configuration and selected weld mode.
P.81	<p>Sense Leads Selection</p> <p>Used in place of DIP switches for configuration of the work and electrode sense leads. This option will only appear in the list if the power source has a hardware selection option.</p> <ul style="list-style-type: none"> • 67 pos polarity = An electrode sense lead is connected using positive polarity. This is used by most GMAW welding procedures. • 67 neg polarity = An electrode sense lead is connected using negative polarity. This is used by most GTAW welding procedures and some Innershield procedures. • 67 & 21 = An electrode sense lead and work sense lead are connected. <p>Hardware Config = The hardware determines the best remote sensing configuration. This is applicable to MIG welding procedures only.</p>
P.82	<p>Voltage Sense Display</p> <p>Allows viewing of Voltage Sense Lead Selection to aid in troubleshooting. The configuration is displayed as a text string on the MSP display whenever the output is enabled. This parameter is not saved on a power cycle, but will be reset to False.</p>

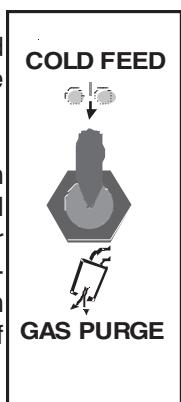
USER DEFINED PARAMETERS

Parameter	Definition
P.99	<p>Show Test Modes</p> <p>Most power sources contain weld modes used for calibration and test purposes. By default, the machine does not include test weld modes in the list of weld modes that are available to the operator. To manually select a test weld mode, set this option to "Yes". When the power source is turned off and back on again, the test modes will no longer appear in the mode list. Test weld modes typically require the machine output to be connected to a grid load and cannot be used for welding.</p>
P.100	<p>View Diagnostics</p> <p>Diagnostics are only used for servicing or troubleshooting the Power Wave system. Select "Yes" to access the diagnostic options in the menu. Additional parameters will now appear in the setup menu (P.101, P.102, etc).</p>
P.101	<p>View Event Logs</p> <p>Used for viewing all the system event logs. Press the right MSP Button to enter the option. Rotate Set knob to select the desired system log to read. Press the right button again to enter the selected log. Rotating the Set knob will scroll through the event log, displaying the log index number, event code and some other data. Press the left button to back out to select another log. Press the left button again to exit this option.</p>
P.102	<p>View Fatal Logs</p> <p>Used for viewing all the system fatal logs. Press the right MSP Button to enter the option. Rotate Set knob to select the desired log to read. Press the right button again to enter that log. Rotating the Set knob will scroll through the log, displaying the log index number and fatal code. Press the left button to back out to select another log. Press the left button again to exit this option.</p>
P.103	<p>View Software Version Information</p> <p>Used for viewing the firmware versions for each board in the system. Press the right MSP Button to enter the option. Rotate Set knob to select the desired board to read. Press the right button again to read the firmware version. Press the left button to back out to select another board. Rotate the SET knob to select another board, or press the left button to exit this option.</p>
P.104	<p>View Hardware Version Information</p> <p>Used for viewing the hardware version for each board in the system. Press the right MSP Button to enter the option. Rotate Set knob to select the desired board to read. Press the right button again to read the hardware version. Press the left button to back out to select another board. Press the left button again to exit this option.</p>
P.105	<p>View Welding Software Information</p> <p>Used for viewing the Weld Set in the Power Source. Press the right MSP Button to read the Weld Set version. Press the left button to back out and exit this option.</p>
P.106	<p>View Ethernet IP Address</p> <p>Used for viewing the Ethernet Network IP address if there is an Ethernet board present in the system. Press the right MSP Button to read the IP Address. Press the left button to back out and exit this option. The IP address cannot be changed using this option.</p>
P.107	<p>View Power Source Protocol</p> <p>Used for viewing the type of power source the feeder is connected to. Press the right MSP Button to identify the power source as either LincNet or ArcLink. Press the left button to back out and exit this option.</p>

4. COLD FEED / GAS PURGE SWITCH

Cold Feed and Gas Purge are combined into a two position momentary toggle switch.

To activate Cold Feeding, hold the switch in the UP position. The wire drive will feed electrode but neither the power source nor the gas solenoid will be energized. Keeping the electrode and gun electrically "cold". Adjust the speed of cold feeding by rotating the WFS knob.

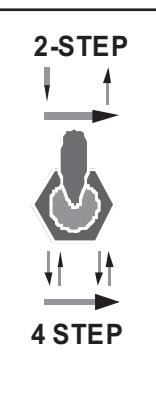


- This feature is useful for threading the electrode through the gun.
- While the "cold feed" circuit is activated, adjust the wire feed speed using the WFS knob.

Hold with toggle switch in the DOWN position to activate Gas Purge and let the shielding gas flow. The gas solenoid valve will energize but neither the power source output nor the drive motor will be turned on. The Gas Purge switch is useful for setting the proper flow rate of shielding gas. Flow meters should always be adjusted while the shielding gas is flowing.

5. 2-STEP / 4-STEP TRIGGER SWITCH

The 2-Step / 4-Step switch has two set positions. Place the switch in the UP position for 2-step Trigger Operation and in the down position for 4-step Trigger Operation.



2 Step Trigger

2 Step trigger operation is the most common. When the gun trigger is pulled, the welding system (power source and wire feeder) cycles through the arc starting sequence and into the main welding parameters. The welding system will continue to weld as long as the gun trigger is activated. Once the trigger is released, the welding system cycles through the arc ending steps.

4-Step Trigger Operation

When the switch is in the 4-Step position the Power Feed™ 10M Single Wire Feeder provides trigger interlock capability (the operator can release the trigger and the system will continue to weld) and it also allows the operator to control the amount of time spent in the start and crater weld modes.

See Sequence of Operation for more information on the overall interaction trigger switch with the weld sequence.

The 2-Step / 4-Step trigger has no effect when welding with SMAW or CAG procedures.

2 STEP TRIGGER OPERATION

(See Figure B.4)

Sometimes it is advantageous to set specific arc start, crater and arc ending parameters for the ideal weld. Many times when welding aluminum crater control is necessary to make a good weld. This is done by setting Start, Crater and Burnback functions to desired values.

SEQUENCE OF OPERATION

Following is the total weld sequence that the Power Feed™ 10M Single Wire Feeder will execute. If any parameter is inactive or its time is set to zero, the weld procedure immediately shifts to the next parameter in the sequence.

1. PREFLOW: Shielding gas begins to flow immediately when the gun trigger is pulled.
2. STRIKE: After preflow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the Strike WFS. If an arc is not established within 1.5 seconds, the power source output and wire feed speed skips to the weld settings.

3. UPSLOPE: Once the wire touches the work and an arc is established, both the machine output and the wire feed speed ramp to the weld settings throughout the start time. The time period of ramping from the start settings to the weld settings is called UPSLOPE.

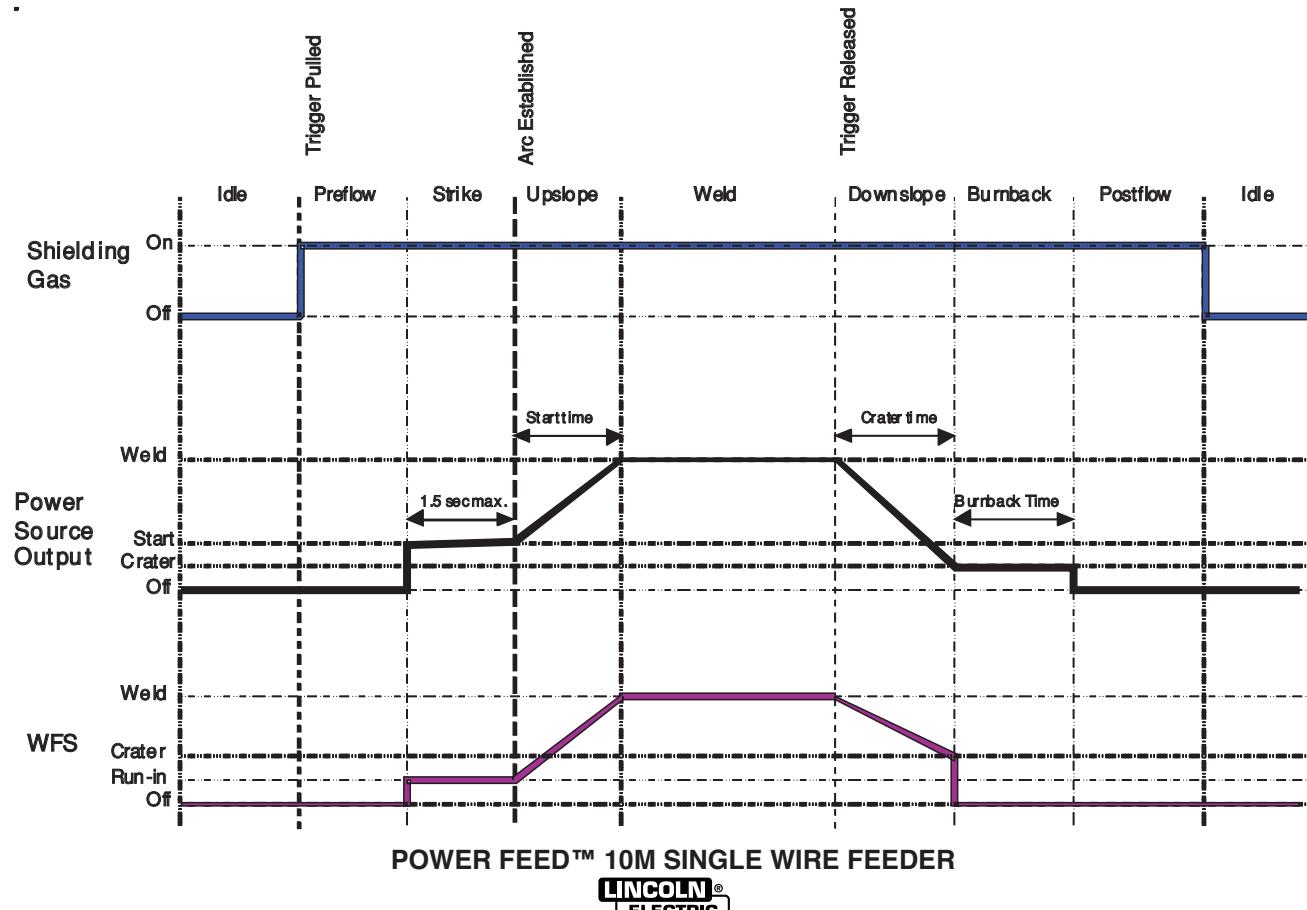
4. WELD: After upslope, the power source output and the wire feed speed continue at the weld settings.

5. CRATER: As soon as the trigger is released, the wire feed speed and power source output ramp to the crater settings throughout the crater time. The time period of ramping from the weld settings to the crater settings is called DOWNSLOPE.

6. BURNBACK: After the crater time expires, the wire feed speed is turned OFF and the machine output continues for the burnback time.

7. POSTFLOW: Next, the machine output is turned OFF and shielding gas continues until the post flow timer expires.

FIGURE B.4



4 STEP TRIGGER OPERATION

(See Figure B.5)

The 4 step trigger sequence gives the most flexibility when the Start, Crater and Burnback functions are active. This is a popular choice when welding aluminum because extra heat may be needed during Start and less heat desired during Crater. With 4 step trigger, the welder chooses the amount of time to weld at the Start, Weld and Crater settings by using the gun trigger. Burnback reduces the likelihood of wire to sticking in the weld pool at the end of a weld and also prepares the end of the wire for the next arc start.

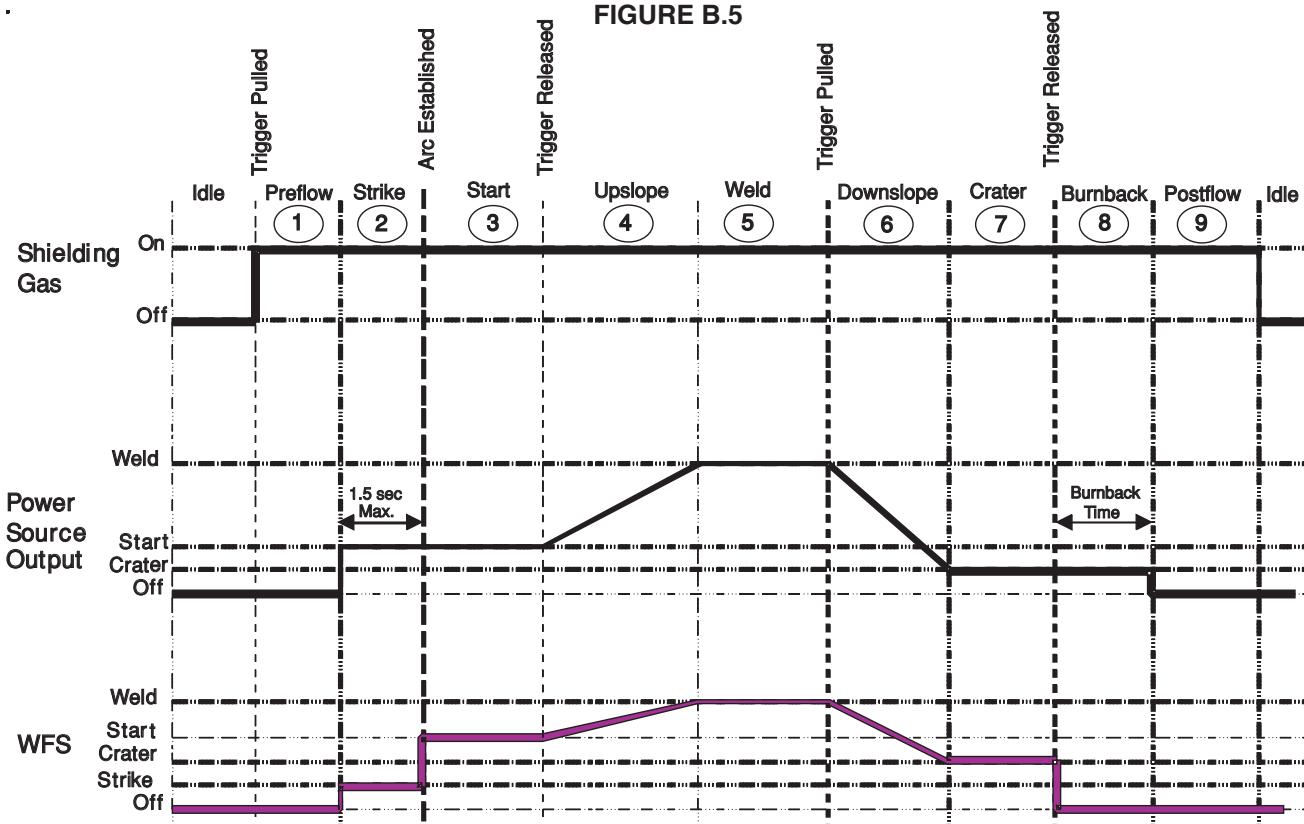
SEQUENCE OF OPERATION

Following is the total weld sequence that the Power Feed™ 10M Single Wire Feeder will execute. If any parameter is inactive or its time is set to zero, the weld procedure immediately shifts to the next parameter in the sequence.

1. PREFLOW: Shielding gas begins to flow immediately when the gun trigger is pulled.
2. STRIKE: After preflow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the Strike WFS. If an arc is not established within 1.5 seconds, the power source output and wire feed speed skips to the weld settings.

3. START: The power source welds at the "Start" WFS and voltage until the trigger is released.
4. UPSLOPE: Once the trigger is released, both the machine output and the wire feed speed ramp up or down to the weld settings throughout the start time. The time period of ramping from the Start settings to the Weld settings is called UPSLOPE.
5. WELD: After Upslope, the power source output and the wire feed speed continue at the Weld settings.
6. DOWNSLOPE: Then as soon as the trigger is pulled, the wire feed speed and power source output ramp to the crater settings during the crater time. The time period of ramping from the weld settings to the crater settings is called DOWNSLOPE.
7. CRATER: After the Downslope time expires, the machine welds at the Crater WFS and voltage settings until either the trigger is released or the Crater time expires.
8. BURNBACK: After the crater time expires, the wire feed speed is turned OFF and the machine output continues for the burnback time.
9. POSTFLOW: Next, the machine output is turned OFF and shielding gas continues to flow until the post flow timer expires.

FIGURE B.5



PROCESS SETUP AND OPERATION

The Power Feed™/Power Wave® system delivers world class arc performance for a wide variety of processes. Using the foundation of Waveform Control Technology™, each weld mode is precisely tuned to meet exacting standards for low spatter, weld bead profile and arc shape.

Customized welding software means even the most difficult materials can be welded with the Power Feed™/Power Wave® system. Copper, Nickel, Silicon Bronze are just a few of the unusual alloys the Power Feed™ system welds with ease when special software is loaded.

Figure B.6 below shows a list of weld modes common on many Power Wave power sources. This table is found on the inside front panel door of the Power Feed™ 10M Single Wire Feeder. The specific list of available weld modes depends upon the power source connected to the Power Feed™ 10M Single Wire Feeder wire feeder.

CC - Stick Mode
 CC - TIG
 CC - Gouge
 CV - Non Synergic
 CV - Synergic
 CV - Pulse
 CV - Pulse on Pulse
 CV - STT

FIGURE B.6

GENERAL

GMAW	STD. CV	5
CV	GMAW POWER MODE	40
FCAW	STD. CV	6
STICK	SOFT (7018)	1
CC	STICK CRISP (6010)	2
TIG	TOUCH START	3
GOUGE	---	9

STEEL

		0.030	0.035	0.045	0.052
GMAW	CO ₂	---	10	20	24
GMAW	Ar (MIX)	94	11	21	25
PULSE (CRISP)	Ar (MIX)	95	12	22	26
PULSE (SOFT)	Ar (MIX)	---	14	19	28
STT (NO TAILOUT)	CO ₂ , Ar/CO ₂	109	109	125	125
STT II	CO ₂ , Ar/CO ₂	110	110	126	126

STAINLESS

		0.030	0.035	0.045
GMAW	Ar (Mix)	61	31	41
GMAW	Ar/He/CO ₂	63	33	43
PULSE	Ar/CO ₂	66	36	46
PULSE	Ar/O ₂	62	32	42
PULSE	Ar/He/CO ₂	---	34	44
STT	Ar/He/CO ₂	109	109	125
STT II	Ar/He/CO ₂	110	110	126

ALUMINUM

	0.035	3/64	1/16	
GMAW	Ar	148	71	73
4043 PULSE	Ar	149	72	74
PULSE-ON-PULSE	Ar	98	99	100

	0.035	3/64	1/16	
GMAW	Ar	151	75	77
5356 PULSE	Ar	152	76	78
PULSE-ON-PULSE	Ar	101	102	103

METAL CORE

	0.045	0.052	1/16	
GMAW	Ar/CO ₂	81	83	85
PULSE	Ar/CO ₂	82	84	86

Non-Synergic Modes

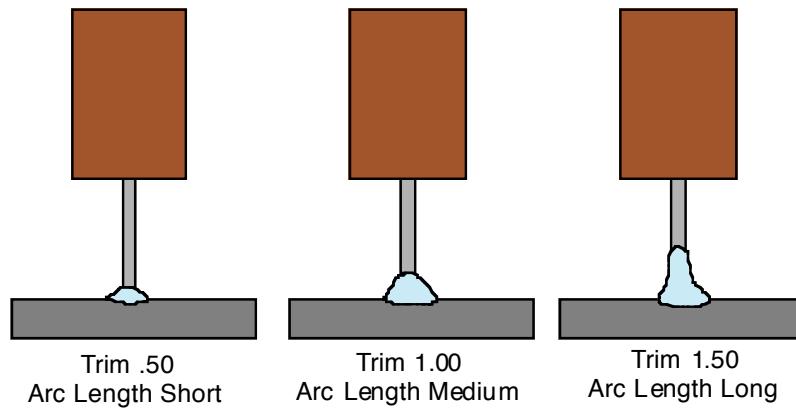
Synergic Modes

STEEL AND STAINLESS SYNERGIC GMAW-P (PULSED MIG) WELDING

Synergic GMAW-P (Pulsed MIG) welding is ideal for low spatter, out of position and reduced heat input applications. During pulse welding, the welding current continuously switches from a low level to a high level and then back again. Each pulse sends a small droplet of molten metal from the wire to the weld puddle.

Pulse welding controls the arc length with 'Trim' instead of voltage. When trim (arc length) is adjusted, the Power Wave automatically recalculates the voltage, current and time of each part of the pulse waveform for the best result. Trim adjusts the arc length and ranges from 0.50 to 1.50, with a nominal value of 1.00 for a 3/4" (19mm) electrode stick-out. Trim values greater than 1.00 increase the arc length, while values less than 1.00 decrease the arc length.

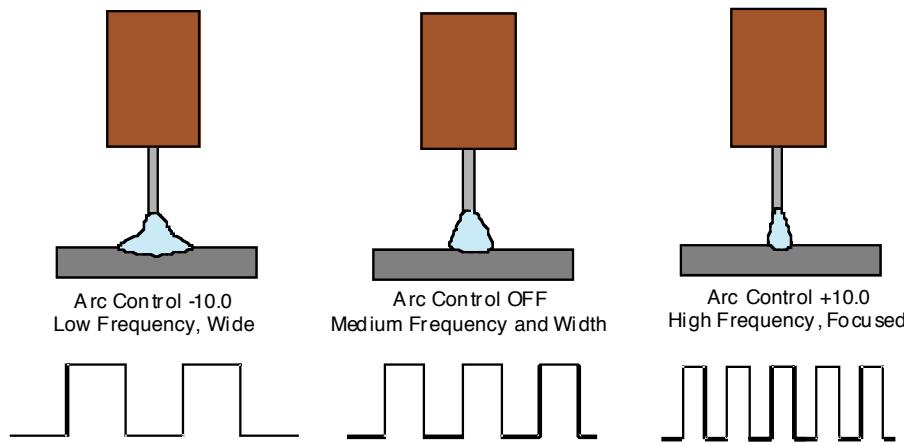
FIGURE B.7a



ARC CONTROL

For steel and stainless pulse modes, Arc Control regulates the focus or shape of the arc. Arc Control values greater than 0.0 increase the pulse frequency while decreasing the background current, resulting in a tight, stiff arc best for high speed sheet metal welding. Arc Control values less than 0.0 decrease the pulse frequency while increasing the background current, for a soft arc good for out-of-position welding.

FIGURE B.7b



ALUMINUM SYNERGIC GMAW-P (PULSED MIG) AND GMAW-PP (PULSE ON PULSE) WELDING

The Power Feed™ 10M Single Wire Feeder and Power Wave welding power source combine to readily produce top quality aluminum welds with excellent appearance, little spatter and good bead shape. Push-pull guns are available for consistent feeding when welding a long distance away from the wire feeder.

Pulse-on-Pulse Welding

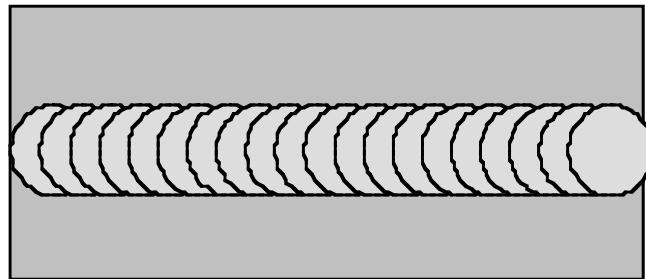
The Power Wave™ system offers both traditional pulse and Pulse-on-Pulse™. Pulse-on-Pulse™ (GMAW-PP) is an exclusive waveform for aluminum welding. Use it to make welds with a "stacked dime" appearance, similar to GTAW welds.

FIGURE B.7c



The pulsing frequency is adjustable. Changing the frequency modulation (or arc control) of the waveform changes the ripple spacing. Faster travel speeds may be achieved by using higher values of frequency modulation.

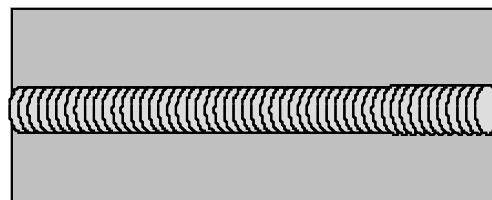
FIGURE B.7d



Frequency Modulation = 10

Wide weld and ripple spacing, fast travel speed.

FIGURE B.7e



Frequency Modulation = 10

Narrow weld and ripple spacing, fast travel speed.

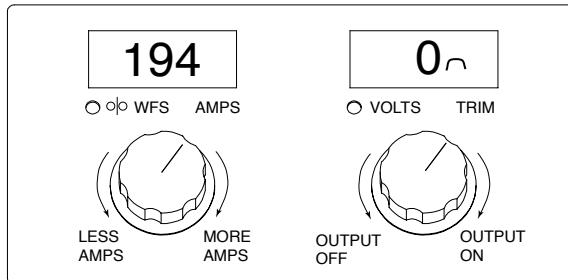
MACHINE FUNCTIONALITY BY WELD PROCESS

CC-STICK

Use the following tables to review how the machine functions (output controls, arc control and weld options) for the weld modes listed in the top table.

CC STICK MODES		
Material	PROCESS	MODE
Steel	Stick Soft(7018)	1
Steel	Stick Crisp(6010)	2

OUTPUT CONTROL KNOBS



ARC CONTROL

ARC FORCE	DESCRIPTION
(Soft)-10.0 to (Crisp)+10.0	Arc Force adjusts the short circuit current for a soft arc, or for a forceful, driving arc. It helps to prevent sticking and shorting organic coated electrodes, particularly globular transfer types such as stainless and low hydrogen. Arc Force is especially effective for root pass on pipe with stainless electrode and helps to minimize spatter for certain electrodes and procedure as with low hydrogen, etc.

START OPTIONS

No arc starting options are active for SMAW (Stick) welding modes.

END OPTIONS

No arc ending options are active for SMAW (Stick) welding modes.

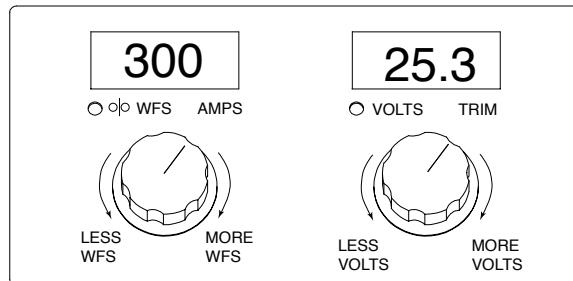
MACHINE FUNCTIONALITY BY WELD PROCESS

CV GMAW/FCAW (NON-SYNERGIC)

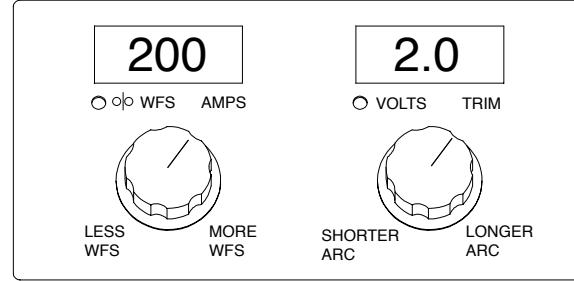
Use the following tables to review how the machine functions (output controls, arc control, Start options and weld options) for the weld modes listed in the top table.

CV NON-SYNERGIC MODES		
Material	PROCESS	WELD MODE
Steel	GMAW, CV	5
Steel	GMAW, POWER MODE	40
Steel	FCAW, CV	6

OUTPUT CONTROL KNOBS, WELD MODE 5 & 6



OUTPUT CONTROL KNOBS, WELD MODE 40



ARC CONTROL

EFFECT / RANGE	DESCRIPTION
(Soft)-10.0 to (Crisp)+10.0	Arc Force adjusts the short circuit current for a soft arc, or for a forceful, digging arc.

START OPTIONS

The start Options available in these Non-Synergic CV weld modes, their adjustment range and function are as follows:

EFFECT / RANGE	DESCRIPTION
Preflow Time 0 - 25.0 seconds	Adjusts the time the gas flows after the trigger is pulled and prior to feeding.
Run-In WFS: Off, 30 to150 in/min.	Run-In sets the wire feed speed from the time the trigger is pulled until an arc is established.
Start Procedure 0 - 10 seconds	The Start Procedure controls the WFS and Volts for a specified time at the beginning of the weld. During the start time, the machine will ramp up or down from the Start Procedure to the preset Welding Procedure.

END OPTIONS

EFFECT / RANGE	DESCRIPTION
Postflow Time 0 to 25.0 seconds	Adjusts the time that shielding gas flows after the welding output turns off.
Crater Procedure (0 TO 10.0 SECONDS)	Crater Procedure controls the WFS and Volts for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp up or down from the Weld Procedure to the Crater Procedure.
Burnback: 0 to .25 Seconds	The burnback time is the amount of time that the weld output continues after the wire stops feeding. It prevents the wire from sticking in the puddle and prepares the end of the wire for the next arc start.
Spot Timer: 0 to 120.0 Seconds	Adjusts the time welding will continue even if trigger is still pulled. This option has no effect in 4-Step Trigger Mode.

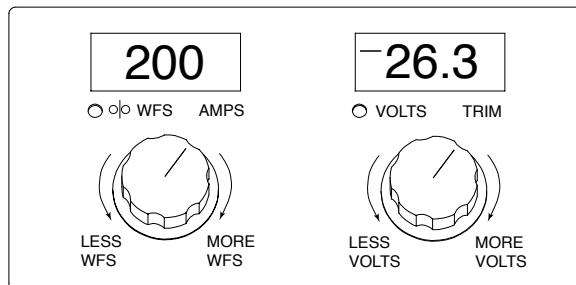
MACHINE FUNCTIONALITY BY WELD PROCESS

GMAW (SYNERGIC)

Use the following tables to review how the machine functions (output controls, arc control, Start options and weld options) for the weld modes listed in the top table.

MATERIAL	PROCESS	GAS	SYNERGIC CV MODES			
			0.030	0.035	0.045	0.052
Steel	GMAW	CO ₂	---	10	20	24
Steel	GMAW	Ar(Mix)	94	11	21	25
Stainless	GMAW	Ar(Mix)	61	31	41	---
Stainless	GMAW	Ar/He/CO ₂	63	33	43	---
Aluminum 4043	TIG	Ar	---	148	71	---
Aluminum 5356	TIG	Ar	---	151	75	---
Metal Core	GMAW	Ar/CO ₂	---	---	---	---

OUTPUT CONTROL KNOBS



ARC CONTROL

EFFECT / RANGE	DESCRIPTION
PINCH EFFECT (-10.0 to +10.0)	Adjust the short circuit current to create a soft arc, or a forceful, digging arc.

START OPTIONS

The start Options available in these synergic CV weld modes, their adjustment range and function are as follows:

EFFECT / RANGE	DESCRIPTION
Preflow Time 0 - 25.0 seconds	Adjusts the time the gas flows after the trigger is pulled and prior to feeding.
Run-in WFS: Off, 30 to 150 in/min.	Run-In sets the wire feed speed from the time the trigger is pulled until an arc is established.
Start Procedure	The Start Procedure controls the WFS. Trim at a specified time at the beginning of the weld. During the start time, the machine will ramp up or down from the Start Procedure to the preset Welding Procedure.

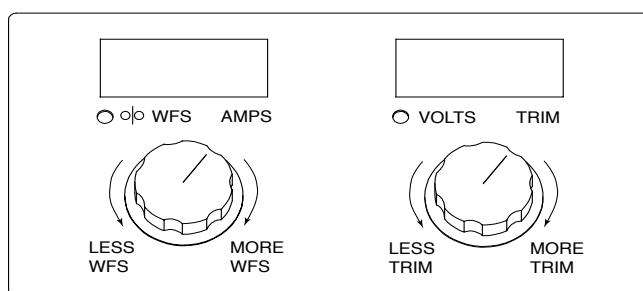
END OPTIONS

EFFECT / RANGE	DESCRIPTION
Postflow Time 0 to 25.0 seconds	Adjusts the time that shielding gas flows after the welding output turns off.
Burnback: 0 to .25 Seconds	The burnback time is the amount of time that the weld output continues after the wire stops feeding. It prevents the wire from sticking in the puddle and prepares the end of the wire for the next arc start.
Crater Procedure	Crater Procedure controls the WFS and volts for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp up or down from the Weld Procedure to the Crater Procedure.
Spot Timer: 0 to 120.0 Seconds	Adjusts the time welding will continue even if trigger is still pulled. This option has no effect in 4-Step Trigger Mode.

MACHINE FUNCTIONALITY BY WELD PROCESS**PULSE AND PULSE-ON-PULSE (SYNERGIC)**

Use the following tables to review how the machine functions (output controls, arc control, Start options and weld options) for the weld modes listed in the top table.

PULSE AND PULSE-ON-PULSE MODES			
MATERIAL	PROCESS	GAS	WIRE SIZE
			0.035 3/64 1/16
ALUMINUM 4043	Pulse	Ar	149 72 74
ALUMINUM 4043	Pulse-on-Pulse	Ar	98 99 100
ALUMINUM 5356	Pulse	Ar	152 76 78
ALUMINUM 5356	Pulse-on-Pulse	Ar	101 102 103

OUTPUT CONTROL KNOBS**ARC CONTROL**

PULSE FREQUENCY:	DESCRIPTION
(Low)-10.0 to (High)+10.0	For Pulse modes, Arc Control changes the pulsing frequency. When the frequency changes, the Power Wave system automatically adjusts the background current to maintain a similar heat input into the weld. Low frequencies give more control over the puddle and high frequencies minimize spatter.

START OPTIONS

PREFLOW TIME	DESCRIPTION
0 - 25.0 seconds	Adjusts the time the gas flows after the trigger is pulled and prior to feeding wire.
RUN-IN WFS: Off, 30 to 150 in/min.	Run-in sets the wire feed speed from the time the trigger is pulled until an arc is established.
Start Procedure	The Start Procedure controls the WFS. Trim at a specified time at the beginning of the weld. During the start time, the machine will ramp up or down from the Start Procedure to the preset Welding Procedure.

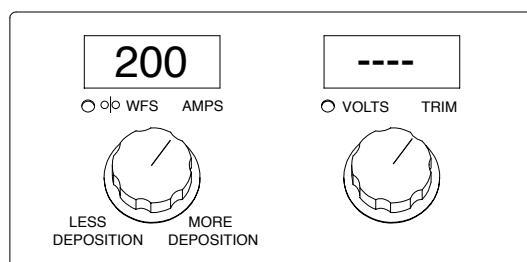
END OPTIONS

EFFECT / RANGE	FUNCTION
Postflow Time: 0 to 25.0 seconds	Adjusts the time that shielding gas flows after the welding output turns off.
Burnback: 0 to .25 Seconds	The burnback time is the amount of time that the weld output continues after the wire stops feeding. It prevents the wire from sticking in the puddle and prepares the end of the wire for the next arc start.
Crater Procedure	Crater Procedure controls the WFS and volts for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp up or down from the Weld Procedure to the Crater Procedure.
Spot Timer: 0 to 120.0 Seconds	Adjusts the time welding will continue even if trigger is still pulled. This option has no effect in 4-Step Trigger Mode.

MACHINE FUNCTIONALITY BY WELD PROCESS**STT AND STT II (SYNERGIC)**

Use the following tables to review how the machine functions (output controls, arc control, Start options and weld options) for the weld modes listed in the top table.

STT AND STT II MODES			
MATERIAL	PROCESS	GAS	WIRE SIZE
			0.035 0.045 0.052
STEEL STAINLESS	STT	Ar/CO ₂ CO ₂	109 125 125
STEEL STAINLESS	STT II	Ar/CO ₂ CO ₂	110 126 126

OUTPUT CONTROL KNOBS (There is no Voltage control when STT welding.)

EFFECT / RANGE	DESCRIPTION
PEAK CURRENT	Peak Current acts similar to an arc pinch control. Peak Current sets the arc length and promotes good fusion. Higher peak current levels will cause the arc to broaden momentarily while increasing arc length. If set too high, globular transfer may occur. Setting it too low may cause instability and wire stubbing. Best practice is to adjust for minimum spatter and puddle agitation.
BACKGROUND CURRENT	Background Current controls the overall heat input in the weld. High background currents flatten the weld bead, and low background currents create a taller rounded contour.
TAIL OUT (STT II MODES ONLY)	Tail out provides additional power without the molten droplet becoming too large. Increase as necessary to add heat input without increasing arc length. Often this results in faster travel speeds. Note that as tail out increases, the peak current and/or background current may need to be reduced.

START OPTIONS

PREFLOW TIME	FUNCTION
0 - 25.0 seconds	Adjusts the time the gas flows after the trigger is pulled and prior to feeding wire.
RUN-IN WFS: Off, 30 to 150 in/min.	Run-in sets the wire feed speed from the time the trigger is pulled until an arc is established.
Start Procedure	The Start Procedure controls the WFS. Trim at a specified time at the beginning of the weld. During the start time, the machine will ramp up or down from the Start Procedure to the preset Welding Procedure.

END OPTIONS

PARAMETER RANGE	FUNCTION
Postflow Time: 0 to 10 seconds	Adjusts the time that shielding gas flows after the welding output turns off.
Crater Procedure	Crater Procedure controls the WFS and volts for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp up or down from the Weld Procedure to the Crater Procedure.
Burnback: 0 to .25 Seconds	The burnback time is the amount of time that the weld output continues after the wire stops feeding. It prevents the wire from sticking in the puddle and prepares the end of the wire for the next arc start.
Spot Timer: 0 to 120.0 Seconds	Adjusts the time welding will continue even if trigger is still pulled. This option has no effect in 4-Step Trigger Mode.

MACHINE FUNCTIONALITY BY WELD PROCESS**GTAW (Touch Start TIG) Welding**

Use the following tables to review how the machine functions (output controls, arc control, Start options and weld options) for the weld modes listed in the top table.

TOUCH START TIG		
Material	PROCESS	MODE
All Metals	Touch Start TIG	3

ARC CONTROL

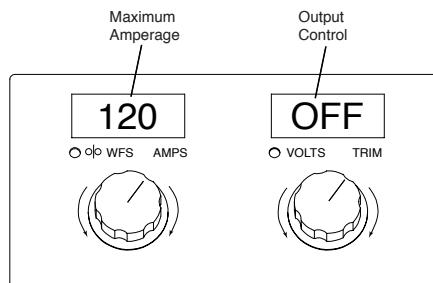
No Arc Controls are active for Touch Start TIG.

START OPTIONS**START PROCEDURE:**

The Start Procedure controls the Amperage at a fixed level for the set amount of time.

END OPTIONS

No Arc ending options are active for Touch Start TIG.

OUTPUT CONTROL KNOBS**GTAW (TIG) WELDING**

The Power Feed™ / Power Wave® system is excellent for Touch Start TIG welding.

The system supports both TIG torches with or without gas control valves. TIG torches with gas control valves connect directly to the gas flow regulator. For TIG torches without gas control valves, connect the output gas hose on the Power Feed™ 10M Single Wire Feeder. While TIG welding, the right encoder can only turn output on and off in 2-step only. Turning the right encoder while 4-step TIG is selected will cause a message to be displayed indicating that on/off output control is only available in 2-step TIG.

Touch Start TIG Weld Sequence	No Foot/Hand Amptrol	With Foot/Hand Amptrol
TIG torches without built-in Gas Valves	<ol style="list-style-type: none"> Adjust the arc amperage with the left knob on the display panel. Turn the right knob on the display panel until the Output Control is ON. Gas will start to flow. Touch the tungsten to the work piece. Lift the tungsten to create an arc and weld. Stop welding by turning the Output Control to OFF, or by pulling away the tungsten from the work. Gas flow will continue for a short time and then shut-off. 	<ol style="list-style-type: none"> Adjust the maximum arc amperage with the left knob on the display panel. Touch the tungsten to the work piece. Press the foot pedal or slide the hand ampstron a slight amount. Gas will start to flow. Lift the tungsten to create an arc. Regulate the arc current with the foot pedal or hand ampstron. Stop welding by releasing the foot pedal or hand ampstron, or by pulling the tungsten away from the work. Gas will continue for a short time and then shut-off.
TIG torches with built-in Gas Valves	<ol style="list-style-type: none"> Adjust the arc amperage with the left knob on the display panel. Turn the right knob on the display panel until the Output Control is ON. Open the gas valve on the TIG torch. Touch the tungsten to the work piece. Lift the tungsten to create an arc and weld. Stop welding by turning the Output Control to OFF, or by pulling away the tungsten from the work. Close the gas valve on the TIG torch. 	<ol style="list-style-type: none"> Adjust the maximum arc amperage with the left knob on the display panel. Touch the tungsten to the work piece. Press the foot pedal or slide the hand ampstron a slight amount. Open the gas valve on the TIG torch. Lift the tungsten to create an arc. Regulate the arc current with the foot pedal or hand ampstron. Stop welding by releasing the foot pedal or hand ampstron, or by pulling the tungsten away from the work. Close the gas valve on the TIG torch.

USER MEMORIES

Recall a memory with memory buttons

To recall a user a memory, press one of the six user memory buttons. The memory is recalled when the button is released. Do not hold the button for more than two seconds when recalling a user memory.

Recall a memory with the gun trigger

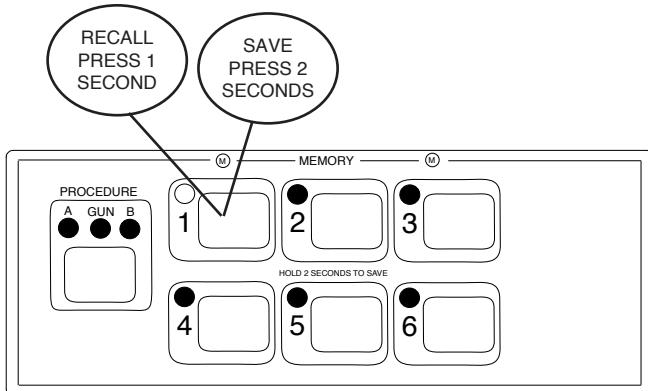
If desired, memories 2 through 6 can be recalled with the gun trigger. For example, to recall memory 3, quickly pull and release the gun trigger 3 times without welding.

Note: the Power Feed™ 10M Single Wire Feeder is factory set with this feature disabled. Use the SETUP menu and change P.4 to enable memory recall with the gun trigger.

Save a memory with memory buttons

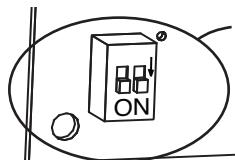
To save a memory, press and hold the desired memory button for two seconds. When the button is initially pressed, the corresponding LED will illuminate. After two seconds, the LED will turn off. Do not hold the button for more than 5 seconds when saving a user memory.

Note that memories may be locked in the Setup menu to prevent accidental overwrite of the memories. If an attempt is made to save a memory when memory saving is locked, the message "Memory save is Disabled!" will appear briefly in the MSP4 display.



DIP SWITCH SETTINGS

"S9" Switch on M20122-1 P.C. board Memory Panel shows that Dip Switchs are in the ON position. (See Below)



6. OPTIONAL DUAL PROCEDURE/MEMORY PANEL OPERATION

The Dual Procedure/Memory Panel performs three functions:

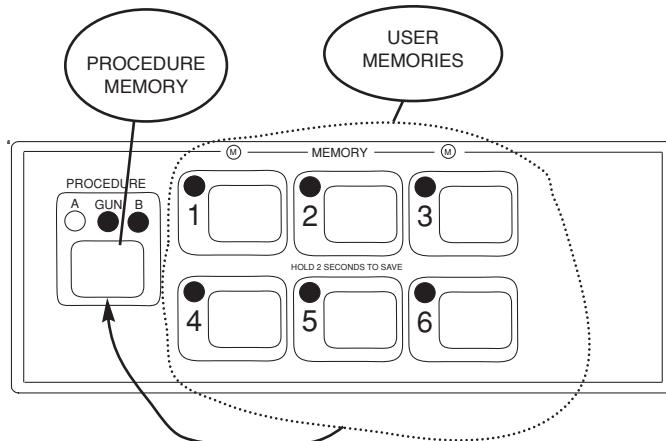
- Weld procedure selection
- Memory save and recall
- Limits setting

There are two procedure memories (A and B) and six user memories (1-6).

Procedure Memory vs. User Memory

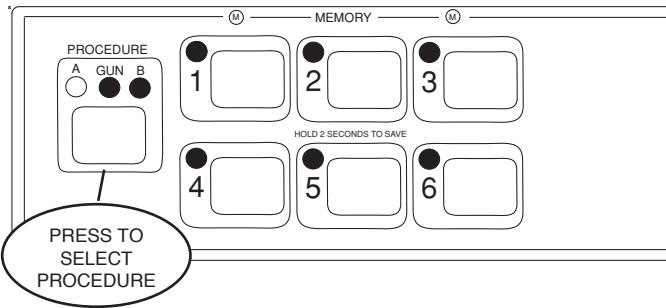
Procedure memory is used while welding. Changes to the weld procedure (WFS, voltage, arc control, etc.) immediately change the contents inside the selected procedure memory. Procedure memory saving is done automatically.

User memories work by copying the weld procedure from one of the six memories into either the A or B procedure. Weld procedures are saved into the memories only when the operator chooses.



Using Procedure Memories

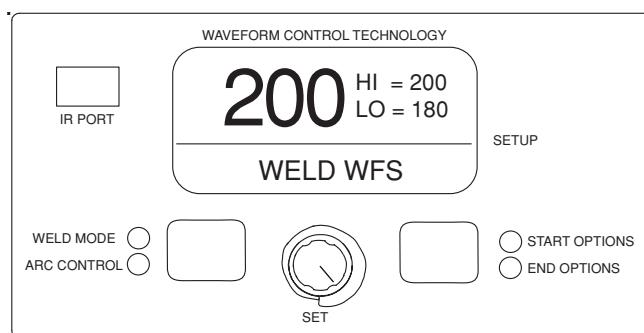
Procedure memories can be selected by choosing either "A" or "B" procedure directly with the memory panel, or by selecting "GUN" and using a dual procedure gun to select between procedure "A" and "B". When selecting procedures with the gun switch, "A" or "B" will flash to show which procedure is active.



LIMIT SETTING

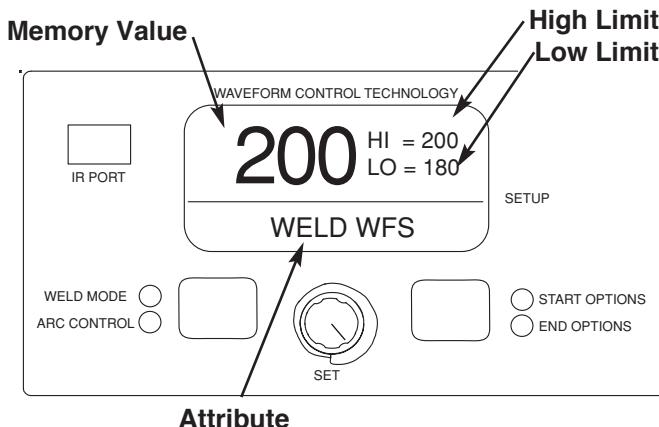
Each user memory can be optionally configured to limit the user's range of control over some user interface settings. By default, user limits are not enabled. To set limits for a selected memory, first select a weld mode and perform a memory save. Next, press and hold the memory button for five seconds. Release the memory button when the memory LED begins to blink rapidly and the Mode Select Panel displays indicate "Set Limits".

If the passcode has been set to a value other than zero, the user will be prompted to enter it. If the passcode is zero, the Mode Select Panel will immediately display the Limit Setup menu and the SETUP LED will illuminate:



The above example shows a wire mode, constant current weld modes would show "Weld Amps" rather than "Weld WFS".

There are four items displayed on each Limit Setup screen. The long alphanumeric display shows the selected attribute (e.g. Weld WFS, Volts, etc.). The short alphanumeric displays show the selected attribute's high and low user limits. The 7-segment displays show the value that is copied to procedure memory when a memory recall is performed.



One of these four items will blink to indicate which item will change when the Mode Select Panel Knob is rotated. Initially, the selected item will be the attribute. To select the high limit, press either Mode Select Panel button and the high limit value will begin to blink. Pressing either Mode Select Panel button again will cause the memory value to blink, pressing a third time will cause the low limit to blink.

Weld modes cannot be selected from the Limits Setup menu; the mode must be selected and saved to memory prior to entering the Limits Setup menu.

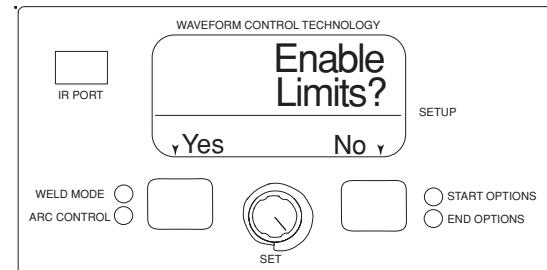
The memory value, high and low limit values are bound by the limits of the machine. For example, weld mode 49 may allow the wire feed speed to be adjusted between 10 and 200 in/min. These are referred to as "machine limits". Machine limits can vary between power sources and are also weld mode dependent.

The memory value must always be less than or equal to the high limit and greater than or equal to the low limit. The high limit must always be greater than or equal to the low limit and the low limit must always be less than or equal to the high limit. The rules are enforced automatically. If the low limit is increased above the memory value, the memory value will automatically increase.

To lock an attribute to a specific value, set the high and low limits to the desired value. The user will not be able to change it.

After setting limits, press the memory button that is flashing. The Mode Select Panel displays will prompt the user to save or discard the limit changes just made.

By pressing the Mode Select Panel button labeled YES, changes to limits are saved and user limits are automatically enabled. By pressing NO, any changes made to limits are discarded and the limit enable/disable state is not changed.



To enable or disable limits that have been established for any memory, press and hold the respective memory button in for more than 10 seconds until the Mode Select Panel displays "Enable Limits?" Pressing "Yes" will use the established limits, while pressing "No" will ignore the established limits. The limits that have been set for any memory location will not be erased if they are disabled.

OPTIONAL:

K2339-1	Push-Pull Connection Kit	Includes: Push-Pull Gun Receiver Bushing, Fittings, Modified Gas-Bypass Valve, Valve Removal Tool and Control Cable Extension Assembly.
K2429-1	ArcLink "T" Cable Connector	Includes: 1 "T" connector for connecting 2 Wire Feeders to 1 Power Source.
K2360-1	Dual Procedure/Memory Panel	Includes: 1 memory panel
K1543-xx	ArcLink Cables	Includes: 1 ArcLink cable of length "xx"
K1796-xx	Co-Axial Power Cable	Includes: 1 Coaxial weld cable of length "xx". Ends of the weld cable have lug connections.
K1842-xx	Weld Power Cable	Includes: Lug to Lug, 3/0 Cable of length "xx".
K1500-1	Gun Receiver Bushing (for guns with K466-1 Lincoln gun connectors; Innershield and Subarc guns)	Includes: Gun receiver bushing, set screw and hex key wrench.
K1500-2	Gun Receiver Bushing (for guns with K466-2, K466-10 Lincoln gun connectors; Magnum 200/300/400 guns and compatible with Tweco® #4)	Includes: Gun receiver bushing with hose nipple, set screw and hex key wrench.
K1500-3	Gun Receiver Bushing (for guns with K1637-7 Lincoln gun connectors; Magnum 550 guns and compatible with Tweco® #5)	Includes: Gun receiver bushing with hose nipple, set screw and hex key wrench.

K1500-4	Gun Receiver Bushing (for gun with K466-3 Lincoln gun connectors; compatible with Miller® guns.)	Includes: Gun receiver bushing with hose nipple, set screw and hex key wrench.
K1500-5	Gun Receiver Bushing (compatible with Oxo® guns.)	Includes: Gun receiver bushing with hose nipple, 4 guide tubes, set screw and hex key wrench.
K489-7	Gun Receiver Bushing (for Lincoln Fast-Mate guns.)	Includes: Gun receiver bushing with trigger connector.
K466-2	Magnum 200/300/400 to K1500-2 Adapter	Includes: Gun adapter, cotter pin, hex key wrench, wrench.
K613-7	Magnum 550 to K1500-3 Adapter	Includes: Trigger adapter, gun adapter and hex key wrench.
K1546-1	Incoming Bushing, Lincoln Conduit .025- 1/16"	Includes: Incoming bushing and hex key wrench.
K1546-2	Incoming Bushing, Lincoln Conduit 1/16-1/8"	Includes: Incoming bushing and hex key wrench.
K1733-1	Wire Straightener	Includes: Wire Straightener.
K870-1	Foot Amptrol	Includes: Foot Amptrol
K936-1	Hand Amptrol LA-9/-17/LW20	Includes: Hand Amptrol LA-9/-17/LW20
K936-2	Hand Amptrol LA-26/LW-18	Includes: Hand Amptrol LA-26/LW-18

K162-1	Spindle Adapter, for Readi-Reels and 2" ID spools up to 60 lb.	Includes: Spindle Assemble with locking clip.
K435	Spindle Adapter, for mounting 14 lb. Innershield Coils on 2" spindles.	Includes: Spindle Adapter made from 2 coil retainers. (Electrode not included.)
K468	Spindle Adapter, for mounting 8" dia. spools on 2" spindles.	Includes: Spindle Adapter.
K363P	Readi-Reel Adapter, for mounting 23-30 lb. reels to 2" spindles.	Includes: Readi-Reel spool adapter. (Spool of electrode not included.)
K438	Readi-Reel Adapter, for mounting 50-60 lb. reels to 2" spindles.	Includes: Readi-Reel spool adapter. (Spool of electrode not included.)
K1504-1	Coil Adapter, for mounting 50-60 lb. coils to 2" spindles.	Includes: 50-60 lb. coil adapter.
K1634-1	Plastic Wire Cover for 30-44 lb. Wire packages.	Includes: Cover, backing plate, wire conduit, incoming bushing for .025 - 1/16" wire, incoming bushing for 1/16" - 1/8" wire, thumb screw, mounting hardware and hex key.
K1634-2	Plastic Wire Cover for up to 60 lb. Wire packages.	Includes: Cover, backing plate, wire conduit, incoming bushing for .025 - 1/16" wire, incoming bushing for 1/16" - 1/8" wire, thumb screw, mounting hardware and hex key.
K590-6	Water Connection Kit	Includes: 2 hoses, 4 quick disconnect fittings, hose clamps and mounting hardware.

SAFETY PRECAUTIONS

! WARNING



ELECTRIC SHOCK can kill.

- Do not touch electrically live parts such as output terminals or internal wiring.
- When inching with gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.
- Turn OFF input power at welding power source before installation or changing drive roll and/or guide tubes.
- Welding power source must be connected to system ground per the National Electrical Code or any applicable local codes.
- Only qualified personnel should perform maintenance work.

Observe all additional Safety Guidelines detailed throughout this manual.

ROUTINE MAINTENANCE

- Check weld cables, control cables and gas hoses for cuts.
- Clean and tighten all weld terminals.
- Inspect and clean drive rolls and inner wire guide and replace if worn.

PERIODIC MAINTENANCE

- Blow out or vacuum the inside of the feeder.
- Every six months check the motor brushes. Replace them if they are less than 1/4" long.
- Every year inspect the gearbox and coat the gear teeth with a moly-disulfide filled grease. DO NOT use graphite grease.

CALIBRATION SPECIFICATION

All calibration is factory set on the Power Feed™ 10M Single Wire Feeder.

To verify the wire feed speed:

- Assemble a .045 (1.2mm) drive roll kit into the Power Feed™ 10M Single Wire Feeder.
- Load a spool of .045 (1.2mm) electrode and thread the electrode through the wire drive.
- Adjust the wire feed speed to 300 in/min (7.62m/min).
- Press the COLD FEED switch and measure the actual wire feed speed with a calibrated wire feed speed tachometer.
- The measured wire feed speed should be within ±2% of the set value.

HOW TO USE TROUBLESHOOTING GUIDE

⚠ WARNING

Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM).

Look under the column labeled "PROBLEM (SYMPTOMS)". This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

Step 2. POSSIBLE CAUSE.

The second column labeled "POSSIBLE CAUSE" lists the obvious external possibilities that may contribute to the machine symptom.

Step 3. RECOMMENDED COURSE OF ACTION

This column provides a course of action for the Possible Cause, generally it states to contact your local Lincoln Authorized Field Service Facility.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact your local Lincoln Authorized Field Service Facility.

⚠ WARNING



ELECTRIC SHOCK can kill.

- Do not touch electrically live parts such as output terminals or internal wiring.
- When inching with gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.
- Turn OFF input power at welding power source before installation or changing drive roll and/or guide tubes.
- Welding power source must be connected to system ground per the National Electrical Code or any applicable local codes.
- Only qualified personnel should perform maintenance work.

Observe all additional Safety Guidelines detailed throughout this manual.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your Local Lincoln Authorized Field Service Facility for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

Error Codes for the Power Wave 455: Code 10555 and below

Note: For any Err # listed below write down the error number for reference and try cycling power to see if the error clears itself. If not, refer to what the What to Do column for the given Err.

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Display shows any of the following:		
Err 001	More than 1 CB with the same group number.	Make sure the group dip switch setting is unique for each CB.
Err 003	Too many objects in group.	A given group can only support up to 7 objects. Remove any objects over 7 from the group either by changing the group dip switch settings or physically disconnecting any objects over 7 in the group.
Err 004	More than 1 object of the same equipment type with the same group # and feed head #.	Adjust the dip switch setting to make either the group # or feed head # unique for all objects of the same equipment type.
Err 005	A feed head has its feed head dip switches set to zero in a group with more than one object.	The appropriate feed head # is 1 through 7. Check the dip switch setting chart in INSTALLATION section and set the switches to make the Feed head ID non-zero.
Err 006	Did not receive a recognition command from the power source.	Check to see if the status light is <u>not</u> solid green on the power source (refer to status light states in OPERATION section if not). Also, check continuity in the communication lines from CB to Power Source (refer to wiring diagram). Refer to Power source trouble shooting section for additional information. If all these avenues fail, replace CB mother PC board.

! CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your Local Lincoln Authorized Field Service Facility for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

Error Codes for the Power Wave 455: Code 10555 and below

Note: For any Err # listed below write down the error number for reference and try cycling power to see if the error clears itself. If not, refer to what the What to Do column for the given Err.

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Display shows any of the following:		
Err 020	An attempt was made to reprogram a CB or feed head but the program did not verify.	Check for potential electrical HF noise generators in the area. Try removing the noise source and programming again. If the Err 020 still occurs, either replace the EEPROM chop(s) in the board being reprogrammed or replace the whole PC board being reprogrammed.
Err 100	The Power Source issued a shut down command for some reason.	See what to Do on Err 006.
Err 200	No Heart beat response from the PS.	See what to Do on Err 006.
Err 201	No Heart beat response from an object.	If this occurs while welding, the status LED should be flashing red on the object that lost heart beat. Otherwise, look for any nodes that are flashing green. This indicates they have not been recognized and there is a power source problem (see power source trouble shooting section). If the status LED is either flashing or solid red, there may be a problem with continuity in the communication lines. Check the lines for continuity, in the cable and harnessing (refer to wiring diagram).
Err 210	EEPROM error.	Parameter recaled at power up was out of range. Rotate encoder knob to reset. Check all settings before proceeding to weld. If this condition persists the replace the CB mother PC board.

CAUTION

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Observe all Safety Guidelines detailed throughout this manual

Error Codes for the Power Wave 455: Code 10675 and above.

ERROR CODES FOR THE POWER WAVE 455

The following is a list of possible error codes that the Power Feed 10M Dual Wire Feeder can output via the display on this user interface.

Note: For any Err # listed below write down the error number for reference and try cycling power to see if the error clears itself. If not, refer to the What to Do column for the given Err.

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Display shows any of the following:		
Err 11	CAN communication bus off.	Probably due to excessive number of communication errors.
Err 12	User Interface time out error.	User Interface is no longer responding to the Power Source. The most likely cause is a fault/bad connection in the communication leads or control cable.
Err 21	Unprogrammed Weld Mode.	Contact the Service Department for instructions on reloading the Welding Software.
Err 22	Empty Weld Table.	Contact the Service Department for instructions on reloading the Welding Software.
Err 23	Weld Table checksum error.	Contact the Service Department for instructions on reloading the Welding Software.
Err 31	Primary overcurrent error.	Excessive Primary current present. May be related to a switch board or output rectifier failure.
Err 32	Capacitor "A" under voltage (Left side facing machine)	Low voltage on the main capacitors. May be caused by improper input configuration. When accompanied by an overvoltage error on the same side, it indicates no capacitor voltage present on that side, and is usually the result of an open or short in the primary side of the machine.
Err 33	Capacitor "B" under voltage (Right side facing machine)	

! CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your Local Lincoln Authorized Field Service Facility for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual
Error Codes for the Power Wave 455: Code 10675 and above.

ERROR CODES FOR THE POWER WAVE 455

As a troubleshooter aid, error code information will now persist on the user interface displays even after the fault is cleared. When a fault occurs that the user interface needs to display, welding will be inhibited for 5 seconds. If the fault has cleared, the error code information can then be removed from the displays by pressing the Reset button, by changing a user interface control or by starting a new weld.

The following is a list of possible error codes that the Power Feed™ 10M Dual Wire Feeder can output via the display on this user interface.

Note: For any Err # listed below write down the error number for reference and try cycling power to see if the error clears itself. If not, refer to the What to Do column for the given Err.

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Display shows any of the following:		
Err 34	Capacitor "A" under voltage (Left side facing machine)	Excess voltage on the main capacitors. May be caused by improper input configuration.
Err 35	Capacitor "B" under voltage (Right side facing machine)	When accompanied by an undervoltage error on the same side, it indicates no capacitor voltage present on that side, and is usually the result of an open or short in the primary side of the machine.
Err 36	Thermal error	Indicates over temperature. Usually accompanied by Thermal LED. Check fan operation. Be sure process does not exceed duty cycle limit of the machine.
Err 37	Softstart error	Capacitor precharge failed. Usually accompanied by codes 32-35.
Err 41	Secondary overcurrent error	The secondary (weld) current limit has been exceeded. When this occurs the machine output will phase back to 100 amps, typically resulting in a condition referred to as "noodle welding". NOTE: For the Power Wave 455/R the secondary limit is 570 amps for the standard stud, and 325 amps for the STT stud and all single phase operation.
Err 43	Capacitor delta error	The maximum voltage difference between the main capacitors has been exceeded. May be accompanied by errors 32-35.

! CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your Local Lincoln Authorized Field Service Facility for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

Error Codes for the Power Wave® 455: Code 10675 and above.

ERROR CODES FOR THE POWER WAVE® 455

The following is a list of possible error codes that the Power Feed™ 10M Dual Wire Feeder can output via the display on this user interface.

Note: For any Err # listed below write down the error number for reference and try cycling power to see if the error clears itself. If not, refer to the What to Do column for the given Err.

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Display shows any of the following:		
Err 49	Single phase error	Indicates machine is running on single phase input power. Usually caused by the loss of the middle leg (L2).
Other		Error codes that contain three or four digits are defined as fatal errors. These codes generally indicate internal errors on the Power Source Control Board. If cycling the input power on the machine does not clear the error, try reloading the operating system. If this fails, replace the control board.

! CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your Local Lincoln Authorized Field Service Facility for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

Error Codes for the Power Wave® 455: Code 10555 and below

Note: For any Err # listed below write down the error number for reference and try cycling power to see if the error clears itself. If not, refer to what the What to Do column for the given Err.

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Display shows any of the following:		
Err 211	Microprocessor RAM error in Control Box.	Turn Power off at power source. Wait 5 seconds. Turn power back on. If Err 211 is displayed again, then replace CB mother PC board.
Err 212	Microprocessor RAM Error in object board other than Control Box (Such as feed head)	Cycle power as in Err 211. If Err 212 is still displayed, then replace PC board in the object with fault. The object with the fault should be solid red on its status LED.
--- (THREE DASHES)	Appears on right display of CB module that contains the status Led	Dashes indicate that the encoder does not control anything including on/off output control.

! CAUTION

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Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
LINC-NET SYSTEM ERROR CODES		
Err 006	<ol style="list-style-type: none"> 1. The wire feeder has not received a recognition command from the power source. Verify the power source is operating properly (Status light steady green.) 2. Check control cable for loose or broken leads. 3. See power source service Manual. 	<p>Check to see if the STATUS LED on the Power Wave 455 is not steady green. If it is not steady green, refer to the Power Wave 455 Status LED Chart and Code Table. Check the control cables for loose or faulty connections. Also check the continuity of all five leads from one end to the other. The control board in the PW 455 may be faulty.</p>
Err 100	<ol style="list-style-type: none"> 1. The power source has issued a shutdown command. Verify the power source is operating properly. (Status light steady green.) 2. Check control cable for loose or broken leads. 3. See power source service Manual. 	<p>See Err 006 in this chart.</p>
ARCLINK SYSTEM ERROR CODES		
Err 31	Primary overcurrent	<ol style="list-style-type: none"> 1. The power source has exceeded input current limits. Adjust the welding procedure to reduce the current draw. The welding procedure may exceed the capacity of the power source. 2. See the power source service Manual.
Err 32	Capacitor bank "A" under voltage.	<ol style="list-style-type: none"> 1. The power source input power may be wired incorrectly. Verify the power source reconnect panel wiring matches the input power. 2. See the power source service Manual.

! CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your Local Lincoln Authorized Field Service Facility for technical troubleshooting assistance before you proceed.

POWER FEED™ 10M SINGLE WIRE FEEDER

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Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)		POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
ARCLINK SYSTEM ERROR CODES			
Err 33	Capacitor bank "B" under voltage.	<ol style="list-style-type: none"> 1. The power source input power may be wired incorrectly. Verify the power source reconnect panel wiring matches the input power. 2. See the power source service Manual. 	
Err 34	Capacitor bank "A" overvoltage.	<ol style="list-style-type: none"> 1. The power source input power may be wired incorrectly. Verify the power source reconnect panel wiring matches the input power. 2. See the power source service Manual. 	
Err 35	Capacitor bank "B" overvoltage.	<ol style="list-style-type: none"> 1. The power source input power may be wired incorrectly. Verify the power source reconnect panel wiring matches the input power. 2. See the power source service Manual. 	
Err 41	Long term secondary overcurrent.	<ol style="list-style-type: none"> 1. The power source has exceeded the output current limits. Adjust the welding procedure to reduce the current draw. The welding procedure may exceed the capacity of the power source. 2. See the power source service Manual. 	If all recommended possible areas of misadjustment have been checked and the problem persists, Contact your local Lincoln Authorized Field Service Facility.
Err 43	Capacitors are out of balance	<ol style="list-style-type: none"> 1. Verify the power source reconnect panel wiring matches the input power. 2. See the power source service Manual. <p>A high level of output current (long average) has caused an overload.</p>	
Err 54	Short term secondary overcurrent.		This happens when the wrong Output stud is used on an STT machine or if there is a missing input phase. When this fault occurs, the machine output will be shut off.

! CAUTION

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PROBLEMS (SYMPTOMS)		POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
ARCLINK SYSTEM ERROR CODES			
Err 44	Main CPU problem.	<ol style="list-style-type: none"> Verify the ground connection to the power source is wired correctly. See the power source service Manual. 	<ol style="list-style-type: none"> The main processor in the system did not respond to another processor within the allotted time. Reflash system with latest software. Replace circuit board.
Err 53	Voltage sense loss.	<ol style="list-style-type: none"> The system detected that one of the voltage sense lead cables was disconnected from the welding circuit during a weld. 	<ol style="list-style-type: none"> Verify that leads 67 and 21 is enabled and connected. See enhanced schematic.
Err 81	Motor overload, long term.	<ol style="list-style-type: none"> The wire drive motor has overheated. Check that the electrode slides easily through the gun and cable. 	<ol style="list-style-type: none"> Remove tight bends from the gun and cable. Check that the spindle brake is not too tight. Verify a high quality electrode is being used. Wait for the error to reset and the motor to cool (approximately 1 minute).
Err 82	Motor overload, short term.	<ol style="list-style-type: none"> The wire drive motor current draw has exceeded limits, usually because the motor is in a locked rotor state. Check that motor can turn freely when idle arm is open. 	<ol style="list-style-type: none"> Verify that the gears are free of debris and dirt.
Err 95	Spool gun or pull gun motor overload.	<ol style="list-style-type: none"> The drive motor in the spool gun or push-pull gun is drawing too much current. 	<ol style="list-style-type: none"> Check spool gun brake or feeding for binding. Replace spool gun circuit board.
Err 263	No usable weld modes.	<ol style="list-style-type: none"> The power source does not have any welding programs loaded. Required configuration could not be found. 	<ol style="list-style-type: none"> Make sure the status of all devices is connected correctly to the machine. Reflash system software.

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PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
OUTPUT PROBLEMS		
The feeder doesn't power up - no display, no cold feed.	1. The Power Feed™ 10M Single Wire Feeder power switch is OFF. Turn the Power Feed™ 10M Single Wire Feeder power switch ON. 2. The Power Wave power source is OFF. Turn ON the Power Wave power source. 3. The circuit breaker for the wire feeder on power source have tripped. Reset the circuit breakers. 4. The control cable may be loose or damaged. Tighten, repair or replace the control cable. 5. The power switch is damaged. Replace the power switch.	1. Check for 40VDC at J81 leads #540 and #500. If voltage is present, replace P.C. BD. If voltage not present, check leads from J81 on BD. to Input 5 pin connector. Refer to machine schematic.
No shielding gas.	1. The gas supply is OFF or empty. Verify the gas supply is ON and flowing. 2. The gas hose is cut or crushed. Route the gas hose so it avoids sharp corners and make sure nothing is on top of it. Repair or replace damaged hoses. 3. Dirt or debris is in the solenoid. Apply filtered shop air at 80psi to the solenoid to remove dirt. 4. There is a loose solenoid connection. Remove the cover and check that all connections are in good condition. 5. The solenoid has failed.	1. Check for 6.5VDC with trigger pulled at J83 leads #553 and #554. If voltage is present replace solenoid. If voltage is not present replace P.C. BD. Refer to machine schematic.

! CAUTION

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TROUBLESHOOTING

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Inconsistent wire feeding or wire not feeding but drive rolls turning.	<p>1. The gun cable is kinked and/or twisted. Keep the gun cable as straight as possible. Avoid sharp corners or bends in the cable.</p> <p>2. The wire is jammed in the gun and cable. Remove the gun from the wire feeder and pull the jammed wire out of the gun and cable.</p> <p>3. The gun liner is dirty or worn. Blow dirt out of the liner with low pressure (40psi or less). Replace the liner if worn.</p> <p>4. The electrode is rusty or dirty. Use only clean electrode. Use quality electrode, like L-50 or Super Arc L-56 from Lincoln Electric.</p> <p>5. The contact tip is partially melted or has spatter. Replace the contact tip.</p> <p>6. Improper gun liner, tip, drive rolls and/or inner wire guide. Verify the proper parts are installed.</p> <p>7. Incorrect tension arm pressure on the drive rolls. Adjust the tension arm per the Instruction Manual. Most electrodes feed well at a tension arm setting of "3".</p> <p>8. Worn drive roll. Replace the drive rolls if worn or filled with dirt.</p>	<p>If all recommended possible areas of misadjustment have been checked and the problem persists, Contact your local Lincoln Authorized Field Service Facility.</p>

! CAUTION

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TROUBLESHOOTING

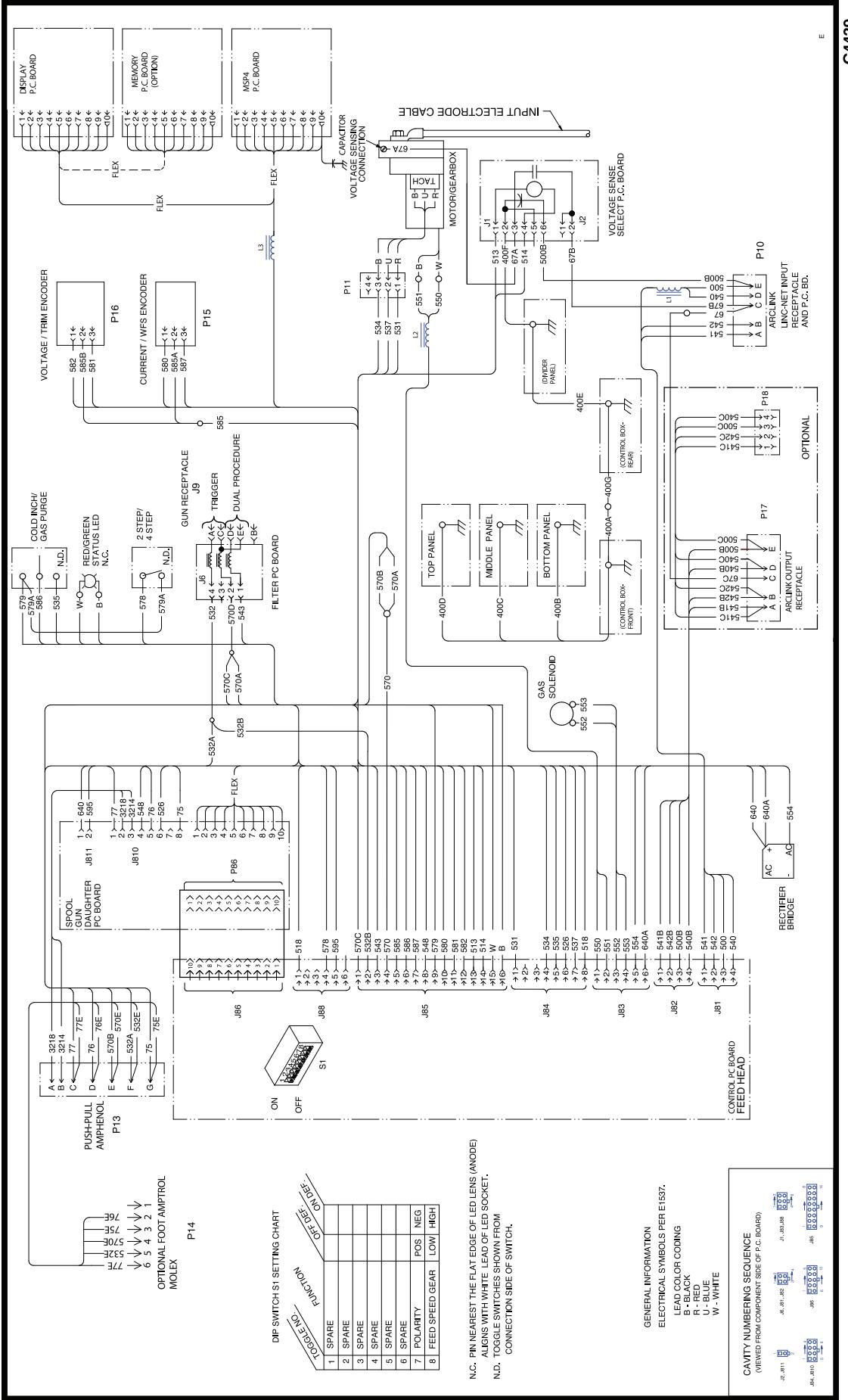
Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Wire feed speed consistently operates at the wrong value.	1. The wire feeder gear setting is not properly set. Verify the Power Feed™ 10M Single Wire Feeder software setting matches the gear mounted. See the Instruction Manual for setting the gear speed.	
Variable or "hunting" arc.	1. Wrong size, worn and/or melted contact tip. Replace the contact tip. 2. Worn work cable or poor work connection. Verify all work and electrode connections are tight and that the cables are in good condition. Clean/replace as necessary. 3. Wrong polarity. Adjust polarity to the recommended procedure. Verify DIP switch #7 setting matches the electrode polarity. 4. The gas nozzle is extended beyond the contact tip or the wire stickout is too long. Adjust the gas nozzle and shorten the contact tip to work distance 1/2" to 3/8" inches. 5. Poor gas shielding on processes requiring gas. Check gas flow and mixture. Remove or block sources of drafts.	If all recommended possible areas of misadjustment have been checked and the problem persists, Contact your local Lincoln Authorized Field Service Facility.
Poor arc starts with sticking or "blast-offs", weld porosity, narrow and ropy looking bead.	1. Improper procedures or techniques. See "Gas Metal Arc Welding Guide" (GS-100).	

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WIRING DIAGRAM - POWER FEED 10M SINGLE FEED HEAD FOR 11086, 11216, 11771



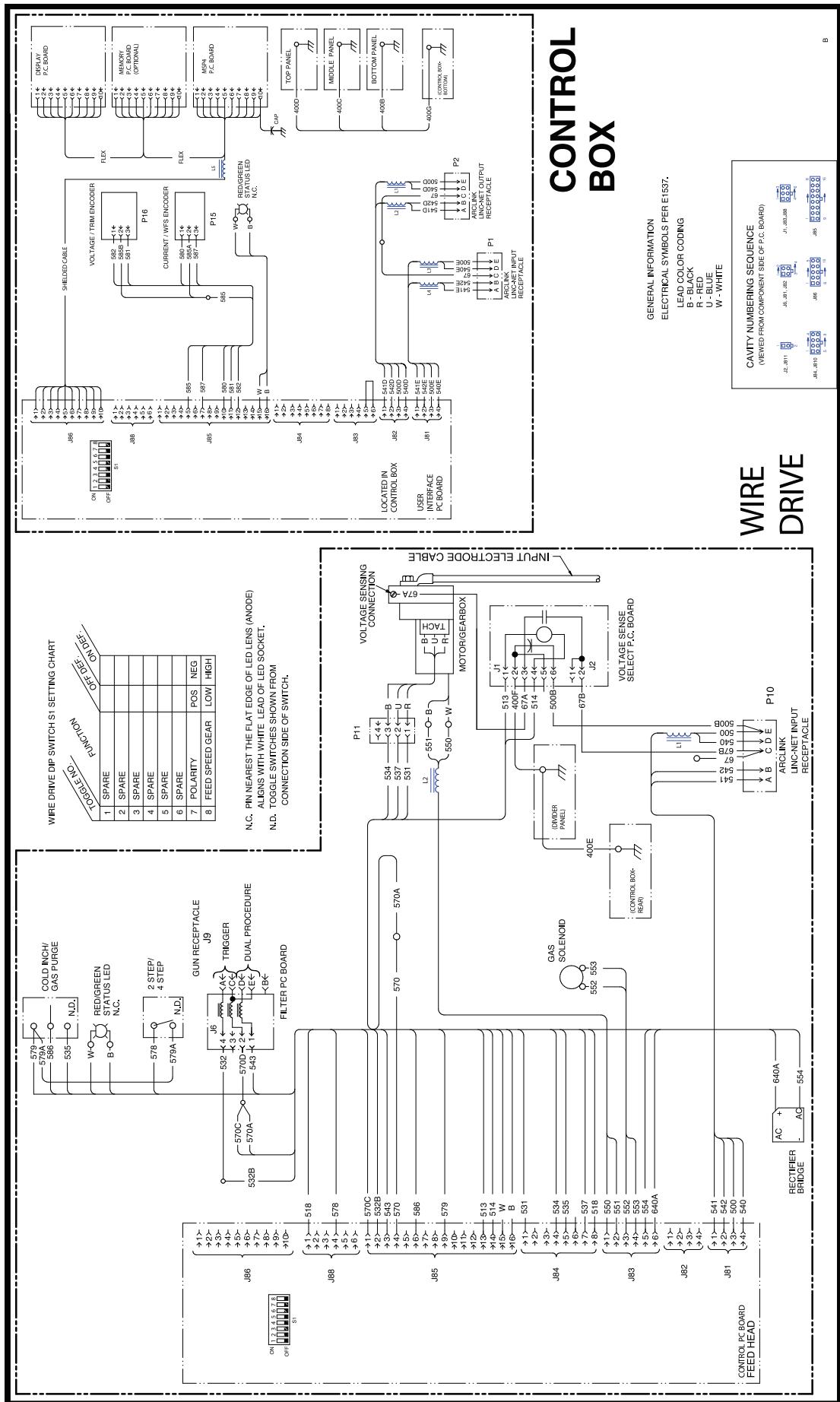
POWER FEED™ 10M SINGLE WIRE FEEDER

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NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

G4439

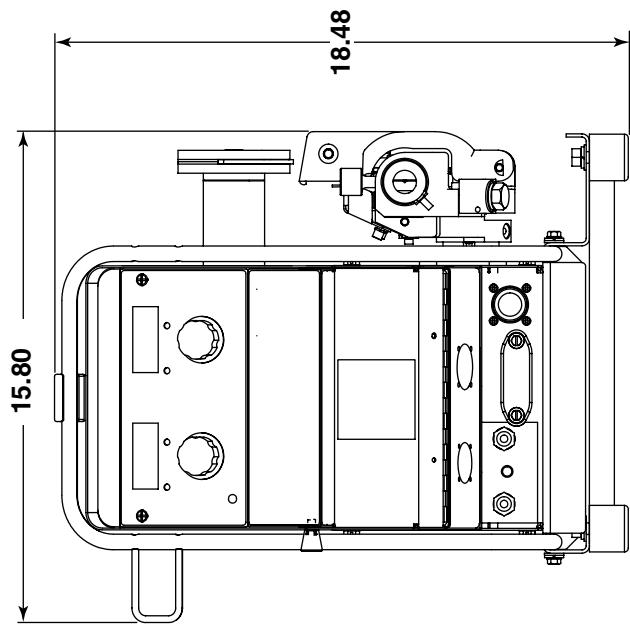
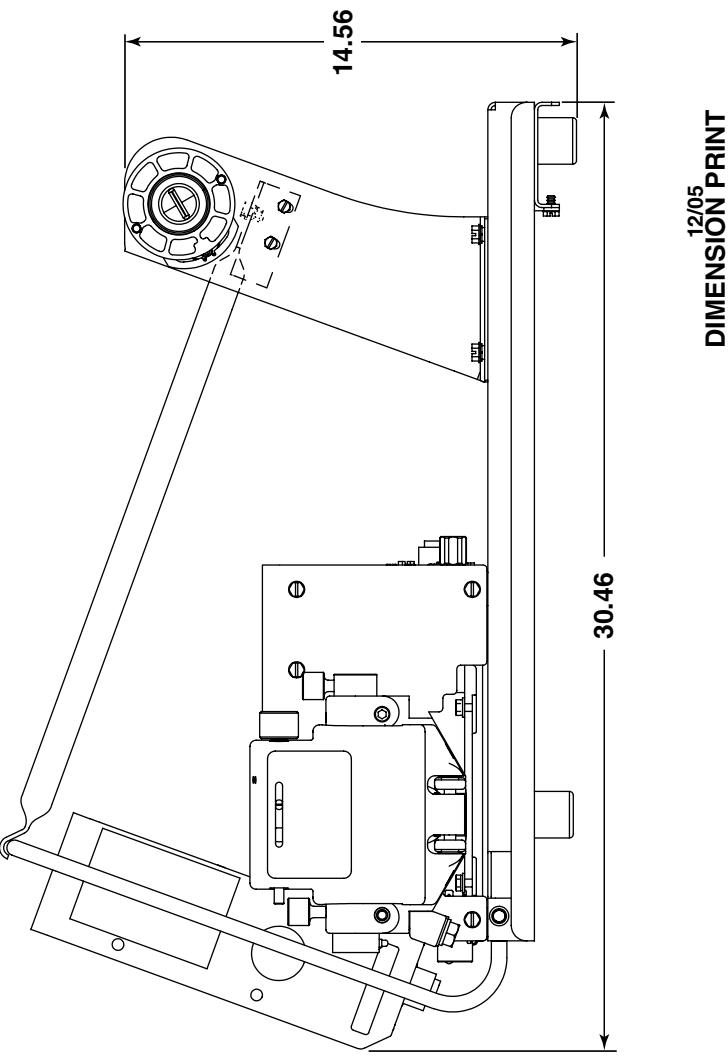
WIRING DIAGRAM - POWER FEED 10M SINGLE BOOM FEEDER FOR CODE 11193, 11772



G4439-1

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

WIRE FEEDER (BENCH MODEL) DIMENSION PRINT



			
WARNING	<ul style="list-style-type: none"> Do not touch electrically live parts or electrode with skin or wet clothing. Insulate yourself from work and ground. 	<ul style="list-style-type: none"> Keep flammable materials away. 	<ul style="list-style-type: none"> Wear eye, ear and body protection.
Spanish AVISO DE PRECAUCION	<ul style="list-style-type: none"> No toque las partes o los electrodos bajo carga con la piel o ropa mojada. Aislese del trabajo y de la tierra. 	<ul style="list-style-type: none"> Mantenga el material combustible fuera del área de trabajo. 	<ul style="list-style-type: none"> Protéjase los ojos, los oídos y el cuerpo.
French ATTENTION	<ul style="list-style-type: none"> Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. Isolez-vous du travail et de la terre. 	<ul style="list-style-type: none"> Gardez à l'écart de tout matériel inflammable. 	<ul style="list-style-type: none"> Protégez vos yeux, vos oreilles et votre corps.
German WARNUNG	<ul style="list-style-type: none"> Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! Isolieren Sie sich von den Elektroden und dem Erdboden! 	<ul style="list-style-type: none"> Entfernen Sie brennbarres Material! 	<ul style="list-style-type: none"> Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese ATENÇÃO	<ul style="list-style-type: none"> Não toque partes elétricas e eletródos com a pele ou roupa molhada. Isole-se da peça e terra. 	<ul style="list-style-type: none"> Mantenha inflamáveis bem guardados. 	<ul style="list-style-type: none"> Use proteção para a vista, ouvido e corpo.
Japanese 注意事項	<ul style="list-style-type: none"> 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 施工物やアースから身体が絶縁されている様にして下さい。 	<ul style="list-style-type: none"> 燃えやすいものの側での溶接作業は絶対にしてはなりません。 	<ul style="list-style-type: none"> 目、耳及び身体に保護具をして下さい。
Chinese 警告	<ul style="list-style-type: none"> 皮肤或湿衣物切勿接触带电部件及焊条。 使你自己與地面和工件絕緣。 	<ul style="list-style-type: none"> 把一切易燃物品移離工作場所。 	<ul style="list-style-type: none"> 佩戴眼、耳及身體勞動保護用具。
Korean 위험	<ul style="list-style-type: none"> 전도체나 옹접봉을 젖은 헝겊 또는 피부로 절대 접촉치 마십시오. 모재와 접지를 접촉치 마십시오. 	<ul style="list-style-type: none"> 인화성 물질을 접근 시키지 마시요. 	<ul style="list-style-type: none"> 눈, 귀와 몸에 보호장구를 착용하십시오.
Arabic تحذير	<ul style="list-style-type: none"> لا تلمس الأجزاء التي يسري فيها التيار الكهربائي أو المكتنزة بجذد الجسم أو بالملابس المبللة بالماء. ضع عازلا على جسمك خلال العمل. 	<ul style="list-style-type: none"> ضع المواد القابلة للاشتعال في مكان بعيد. 	<ul style="list-style-type: none"> ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.

<ul style="list-style-type: none"> Keep your head out of fumes. Use ventilation or exhaust to remove fumes from breathing zone. 	<ul style="list-style-type: none"> Turn power off before servicing. 	<ul style="list-style-type: none"> Do not operate with panel open or guards off. 	WARNING
<ul style="list-style-type: none"> Los humos fuera de la zona de respiración. Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases. 	<ul style="list-style-type: none"> Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio. 	<ul style="list-style-type: none"> No operar con panel abierto o guardas quitadas. 	Spanish AVISO DE PRECAUCION
<ul style="list-style-type: none"> Gardez la tête à l'écart des fumées. Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail. 	<ul style="list-style-type: none"> Débranchez le courant avant l'entretien. 	<ul style="list-style-type: none"> N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés. 	French ATTENTION
<ul style="list-style-type: none"> Vermeiden Sie das Einatmen von Schweißrauch! Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes! 	<ul style="list-style-type: none"> Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!) 	<ul style="list-style-type: none"> Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen! 	German WARNUNG
<ul style="list-style-type: none"> Mantenha seu rosto da fumaça. Use ventilação e exhaustão para remover fumo da zona respiratória. 	<ul style="list-style-type: none"> Não opere com as tampas removidas. Desligue a corrente antes de fazer serviço. Não toque as partes elétricas nuas. 	<ul style="list-style-type: none"> Mantenha-se afastado das partes moventes. Não opere com os painéis abertos ou guardas removidas. 	Portuguese ATENÇÃO
<ul style="list-style-type: none"> ヒュームから頭を離すようにして下さい。 換気や排煙に十分留意して下さい。 	<ul style="list-style-type: none"> メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切って下さい。 	<ul style="list-style-type: none"> パネルやカバーを取り外したまま機械操作をしないで下さい。 	Japanese 注意事項
<ul style="list-style-type: none"> 頭部遠離煙霧。 在呼吸區使用通風或排風器除煙。 	<ul style="list-style-type: none"> 维修前切斷電源。 	<ul style="list-style-type: none"> 儀表板打開或沒有安全罩時不準作業。 	Chinese 警告
<ul style="list-style-type: none"> 얼굴로부터 용접가스를 멀리하십시오. 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오. 	<ul style="list-style-type: none"> 보수전에 전원을 차단하십시오. 	<ul style="list-style-type: none"> 판넬이 열린 상태로 작동하지 마십시오. 	Korean 위험
<ul style="list-style-type: none"> بعد رأسك بعيداً عن الدخان. استعمل التهوية أو جهاز ضغط الدخان للخارج. لكي تبعد الدخان عن المنطقة التي تنفس فيها. 	<ul style="list-style-type: none"> قطع التيار الكهربائي قبل القيام بأية صيانة. 	<ul style="list-style-type: none"> لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه. 	Arabic تحذير

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的說明以及應該使用的銀桿材料，並請遵守貴方的有關勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.



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